HITACHI

No. 0411

CML155XW

SERVICE MANUAL
MANUEL D'ENTRETIEN
WARTUNGSHANDBUCH

CAUTION:
Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this service manual.

ATTENTION:
Avant d'effectuer l'entretien du châassis, le technicien doit lire les «Précautions de sécurité» et les «Notices de sécurité du produit» présentés dans le présent manuel.

VORSICHT:
Vor Öffnen des Gehäuses hat der Service-Ingenieur die „Sicherheitshinweise" und „Hinweise zur Produktsicherheit" in diesem Wartungshandbuch zu lesen.

Data contained within this Service manual is subject to alteration for improvement.

Les données fournies dans le présent manuel d'entretien peuvent faire l'objet de modifications en vue de perfectionner le produit.

Die in diesem Wartungshandbuch enthaltenen Spezifikationen können sich zwecks Verbesserungen ändern.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

NOV 2001

ENGLISH

SAFETY PRECAUTIONS

WARNING: The following precautions must be observed.

ALL PRODUCTS

Before any service is performed on the chassis an isolation transformer should be inserted between the power line and the product.

1. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place.
2. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in any high voltage circuitry area.
3. Many electrical and mechanical parts in HITACHI products have special safety related characteristics. These characteristics are often not evident from visual inspection, nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a ⚠ on the schematics and the replacement parts list.
   The use of a substitute replacement component that does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list, may create electrical shock, fire, X-radiation, or other hazards.
4. Always replace original spacers and maintain lead lengths. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. Insulation resistance should not be less than 2M ohms at 500V DC between the main poles and any accessible metal parts.
6. No flashover or breakdown should occur during the dielectric strength test, applying 3kV AC or 4.25kV DC for two seconds between the main poles and accessible metal parts.
7. Before returning a serviced product to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock. The service technician must make sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

CE MARK

1. HITACHI products may contain the CE mark on the rating plate indicating that the product contains parts that have been specifically approved to provide electromagnetic compatibility to designated levels.
2. When replacing any part in this product, please use only the correct part itemised in the parts list to ensure this standard is maintained, and take care to replace lead dressing to its original state, as this can have a bearing on the electromagnetic radiation/immunity.

PICTURE TUBE

1. The line output stage can develop voltages in excess of 25kV; if the E.H.T. cap is required to be removed, discharge the anode to chassis via a high value resistor, prior to its removal from the picture tube.
2. High voltage should always be kept at the rated value of the chassis and no higher. Operating at higher voltages may cause a failure of the picture tube or high voltage supply, and also, under certain circumstances could produce X-radiation levels moderately in excess of design levels. The high voltage must not, under any circumstances, exceed 29kV on the chassis (except for projection Televisions).
3. The primary source of X-radiation in the product is the picture tube. The picture tube utilised for the above mentioned function in this chassis is specially constructed to limit X-radiation. For continued X-radiation protection, replace tube with the same type as the original HITACHI approved type
4. Keep the picture tube away from the body while handling. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled

LASERS

If the product contains a laser avoid direct exposure to the beam when the cover is open or when interlocks are defeated or have failed.

TABLE OF CONTENTS

1. Precaution and Notices …… 4
1.1 Safety Precaution …… 4
1.2 Product Safety Notice …… 4
1.3 Service Notes …… 4

2. Specifications …… 5
2.1 Monitor Specifications …… 5
2.2 Stereo Speaker …… 6
2.3 Timing Supported – Analog Inputs …… 7
2.4 Timing Supported – Digital Inputs …… 7

3. Control Buttons and Functions …… 8
3.1 User Control Buttons …… 8
3.2 Power LED …… 9
3.2 Tilting the Displays …… 9

4. Disassembly Instructions …… 10

5. General Connection and Applications …… 12
5.1 Connecting the Monitor to the Computer …… 12
5.2 Connecting the Monitor to the AV device …… 14

6. Electronic Circuit Description …… 16
6.1 Main Board Circuit …… 16
6.2 Audio Board Circuit …… 18
6.3 Keyboard Circuit …… 18
6.4 Inverter Circuit …… 18

7 Troubleshooting Flow Chart …… 19

8. Repair Parts List …… 19

9. Mechanical Disassembly …… 19

10. PCB Layout …… 19

Appendix A. Main Board Block Diagram

Appendix B. Mainboard Circuit Diagrams

Appendix C. Audio Board Circuit Diagram

Appendix D. Keyboard Circuit Diagram

Appendix E. Inverter Circuit Diagram

Appendix F. Troubleshooting Flow Chart

Appendix G. Proposed Repair Parts List

Appendix H. Mechanical Disassembly

Appendix I. PCB Layout

1. Precautions and Notices

1.1 Safety Precautions

Although LCD monitors are displays with lower voltage than in the CRTs, the following precautions still should be take care of.

1) Observe all cautions and safety related notes located inside the display cabinet and on the display chassis.
2) Operation of these displays outside the cabinet or with the cover removed involves a shock hazard from the display backlight's inverter. Work on the display should not be attempted by anyone who is not thoroughly familiar with precautions necessary when working on high voltage equipment.
3) Before returning a serviced display to the customer, a thorough safety test must be performed to verify that the display is safe to operate without danger of shock.

1.2 Product Safety Notice

1) Many electrical and mechanical parts in this chassis provide special visual safety protection. The protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc.
2) Before replacing any of these components, read the parts list manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics, as specified in the parts list may create shock, fire or other hazards.

1.3 Service Notes

1) When replacing parts or circuit boards, wrap the wires around terminals before soldering.
2) Keep wires away from high temperature components.
3) Keep cable and their shielding in their original position so as to reduce interference.

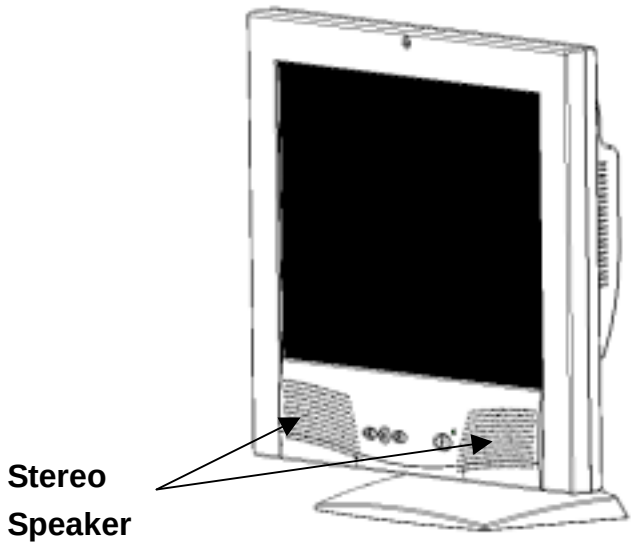
2. Specifications

2.1 Monitor Specification

Power Input	
Voltage	AC 100V to 240 V, 50/60 Hz (External AC Adapter)
Power Consumption	LED color is green: < 40 W LED color is amber: < 5 W
Analog Input	
Video Signals	RGB positive 0.7V p-p
Input Impedance	75Ω (Analog)
Sync Signals	Separate, Positive/Negative TTL voltage levels
Connector	15 pin Mini D type detachable cable
Input Frequency	f_H : 31.47kHz ~ 60.02 kHz f_V : 56 Hz ~ 75 Hz
Resolution (Max.)	1024 x 768 / 75 Hz
Recommended mode	1024 x 768 / 60 Hz
Digital Input	
Input Signals	TMDS
Connector	DVI-D type
Input Frequency	f_H : 31.47kHz ~ 48.36 kHz f_V : 75 Hz
Resolution (Max.)	1024 x 768 / 60 Hz
Recommended mode	1024 x 768 / 60 Hz
Environment	
Operating Conditions	
Temperature	5℃ to 40℃ (41℉ to 104℉) at altitude 0 ~ 2000m 5℃ to 30℃ (41℉ to 86℉) at altitude 2000 ~ 3000m
Relative Humidity	20% to 85% (non-condensing)
Altitude	3000m max.
Storage Conditions	
Temperature	-20℃ to +60℃ (-4℉ to 140℉)
Relative Humidity	5% to 95%
Altitude	10,000m max
Monitor Tilt	
Forward	-5º
Backward	+20º

Panel Characteristics	
Panel Type	15-in (38.1 cm) XGA TFT LCD (active matrix)
Pixel Format	1024(H) x 768(V) (1 pixel = R+G+B dot)
Pixel Pitch	0.297 mm(H) x 0.297 mm(V)
Pixel Configuration	R、G、B vertical stripe
Display Area	304.1 mm(H) x 228.1 mm(V)
Faceplate Coating	Anti-glare, and hard-coating 3H (Haze value = 28)
Luminance	300 Cd/m² (typ.)
Contrast Ration	500:1 (typ.)
White Point	(x, y) = (0.29, 0.31)
Display Color	16,777,216
Viewing Angle	H: -65º ~ 65º (typ.) V: -60º ~ 50º (typ.)
Panel Characteristics	DDC2B
Power Management	Complies with EPA and DPMS
Dimension	376 mm x 381 mm x 204 mm (W x H x D)
Weight	5.5 kg

2.2 Stereo Speakers



1) Impedance: 8 ohms
2) Input power: 1.2 Watts RMS (maximum) X 2
3) Input jack: stereo 1/8-inch mini-jack input

2.3 Timing Supported – Analog Inputs

Mode	Resolution	f_H (kHz)	f_V (Hz)	Pixel Clock (MHz)	H pol.	V pol..
1	640 x 350	31.47	70.09	25.18	+	-
2	640 x 480	31.47	59.94	25.18	-	-
3	640 x 480	37.80	72.81	31.50	-	-
4	640 x 480	37.50	75.00	31.50	-	-
5	800 x 600	35.16	56.25	36.00	+	+
6	800 x 600	37.88	60.32	40.00	+	+
7	800 x 600	48.08	72.19	50.00	+	+
8	800 x 600	46.88	75.00	49.50	+	+
9	1024 x 768	48.36	60.00	65.00	-	-
10	1024 x 768	56.48	70.07	75.00	-	-
11	1024 x 768	60.02	75.03	78.75	+	+
12	720 x 400	31.47	70.08	28.32	-	+
13	640 x 480	35.00	66.67	30.24	-	-
14	832 x 624	49.73	74.55	57.28	-	-

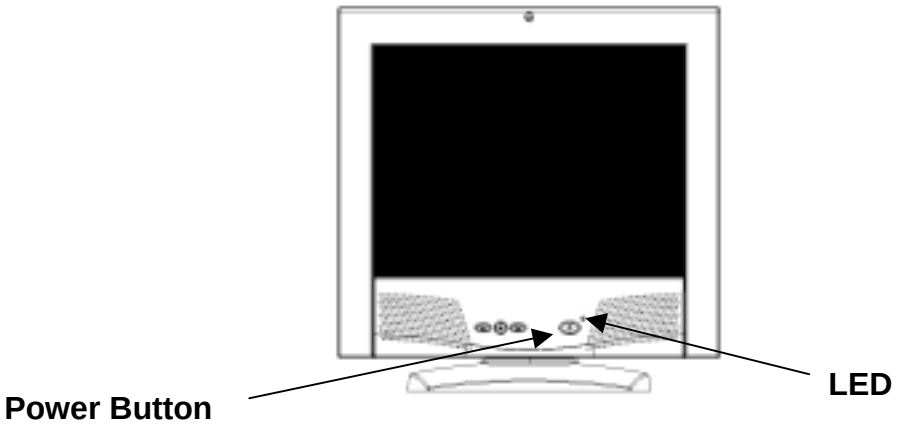
2.4 Timing Supported – Digital Inputs

Mode	Resolution	f_H (kHz)	f_V (Hz)	Pixel Clock (MHz)	H pol.	V pol..
1	640 x 480	31.469	59.940	25.175	-	-
2	640 x 480	37.50	75.00	31.50	-	-
3	800 x 600	37.88	60.3	40.00	+	+
4	800 x 600	46.88	75.00	49.50	+	+
5	1024 x 768	48.363	60.004	65.000	-	-

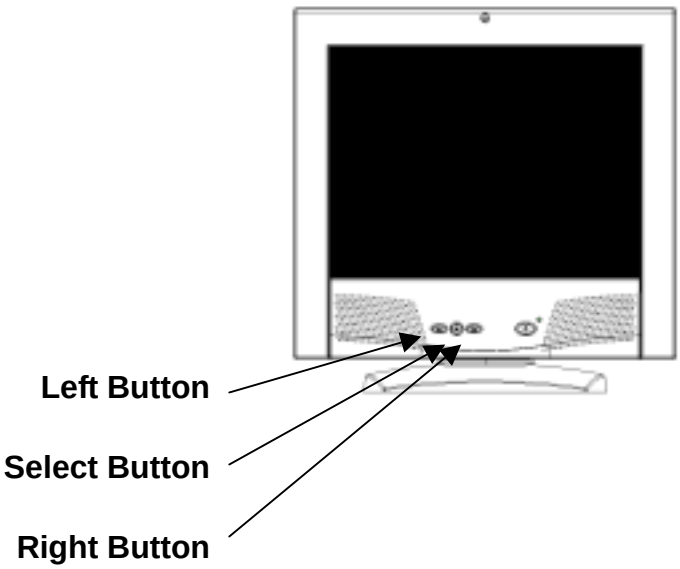
3. Control Buttons and Functions

3.1 User Control Buttons

There is a power button located at the lower center of the front panel, as well as an LED for power status indication as shown below.



Also there are three control buttons, i.e., “Select”, “Left” and the “Right” on the front panel of the display as shown below.



And the associated functions of these keys are described as follows:

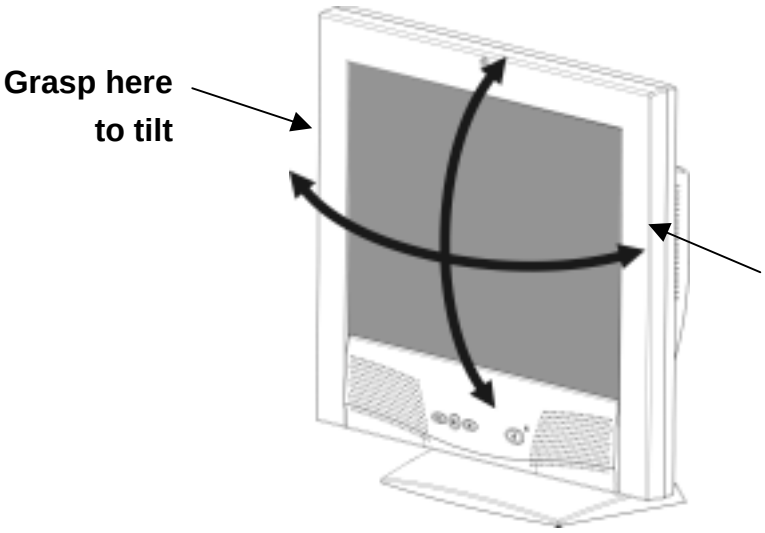
Key	Function Description
POWER	Push to turn on or turn off the display. The power indicator (Green) will light while the display is on.
Select	Display the main On-Screen Display (OSD) window and select options in the windows.
Right	Move forward through the choice in the OSD windows. If an adjustment bar is displayed, this button increases the setting.
Left	Move backward through the choice in the OSD windows. If an adjustment bar is displayed, this button decreases the setting.

3.2 Power LED

The color of the power LED depends on the power status of the monitor. When the LED color is continuously green, it indicates the monitor is at normal operation state. When the LED is in amber, it indicates the monitor is at a power saving state.

3.3 Tilting the Display

CML155XW has a tilt feature that allows you to tilt the display back and forth or swivel the display left and right to find the most comfortable viewing position. To tilt the display, grasp the sides and push the display back or pull it toward you until it is in the desired position. The display can be tilted 20º backward and 5º forward or swiveled 60º left and right.



Note: ***Do not tilt the display by grasping the top edge.***

4. Disassembly Instructions

To disassembly the monitor, follow the steps as below:

1) Face Down the Monitor.

Note: ***Place the monitor face down on a smooth surface covered by soft material to protect the panel faceplate.***

2) Back Cover Removal:

In Fig. 4-1, remove 4 screws indicated as “A” from the four corner of the back cover. Then remove the back cover.

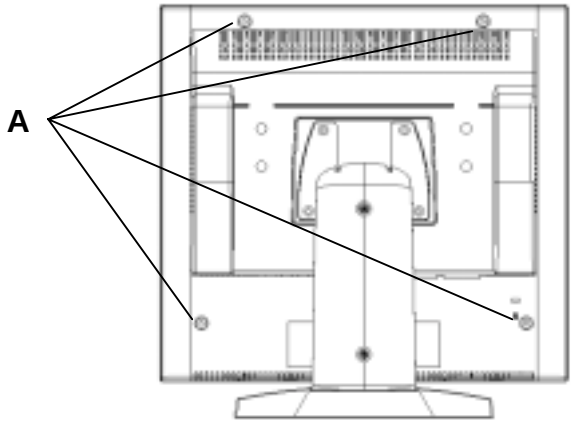


Fig. 4-1

3) Metallic Cover Removal:

In Fig. 4-2, remove 7 screws indicated as “B” from the back metallic cover. Then remove the back metallic cover.

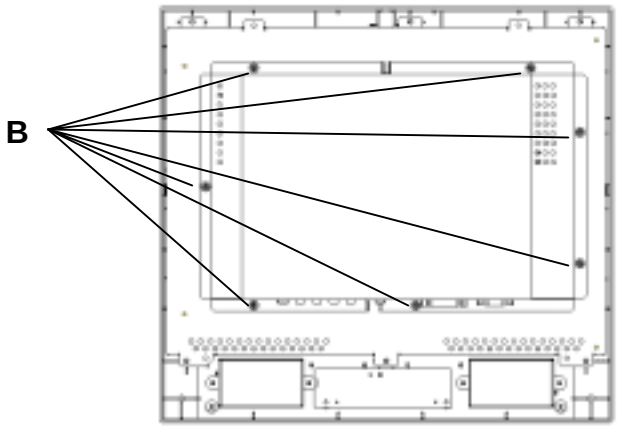


Fig. 4-2

4) PCB Assembly Removal:

Caution: ***When serving or replacing the panel, disconnect the DC power jack completely.***

(a) Unplug all connected wires from the PCB.

(b) Remove 3 screws indicated as “C” from the inverter board, and then remove the board carefully. (left side in Fig. 4-3)

(c) Remove 3 screws indicated as “D” from the audio board, and then remove the board carefully.

(d) Remove 7 screws indicated as “E” from the main board connected with front cover. (Fig. 4-3)

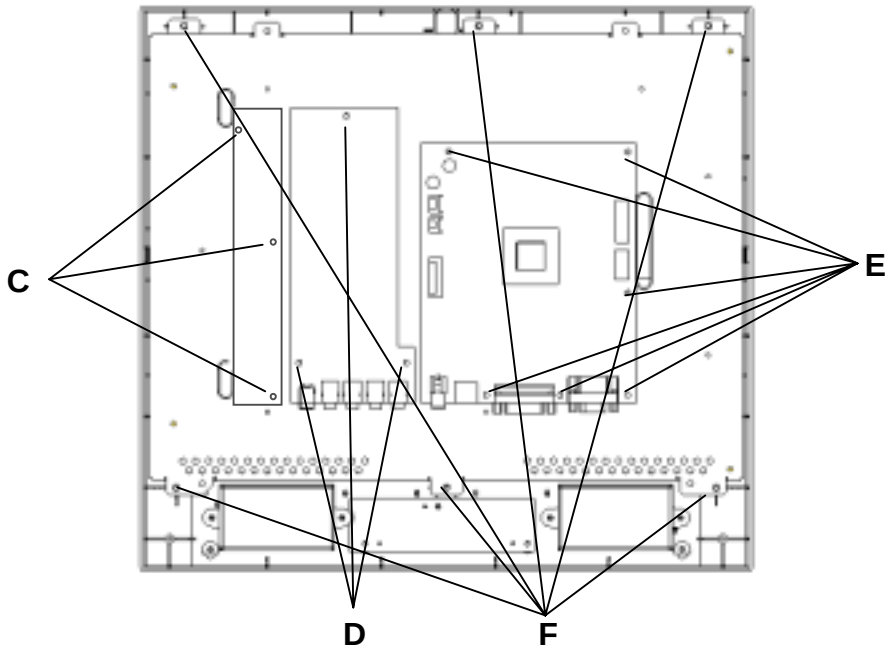


Fig. 4-3

5) Panel Removal:

(a) Remove 6 screws indicated as “F” from the front cover (Fig. 4-3) to remove the panel.

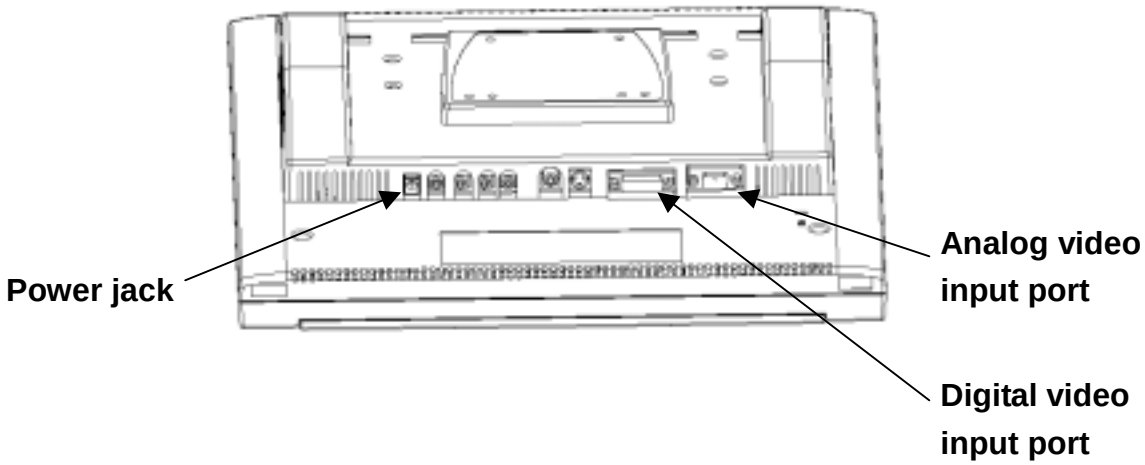
5. General Connection and Applications

Procedures for installing and using this CML155XW LCD monitor are described as below.

5.1 Connecting the monitor to a computer

1) Place the display on a flat, sturdy surface. Choose an area free from excessive heat, moisture, and sunlight. Avoid possible sources of electromagnetic interference, such as transformers, motors, and fluorescent lighting.

2) Locate the AC power adapter with attached power cable and then connect the power cable to the power jack on the back of the display. Plug the three-prong power cord into a power outlet, and plug the other end into the AC power adapter. The three-prong power cord is a shielded type and is provided as a safety precautions to ensure proper electrical grounding.

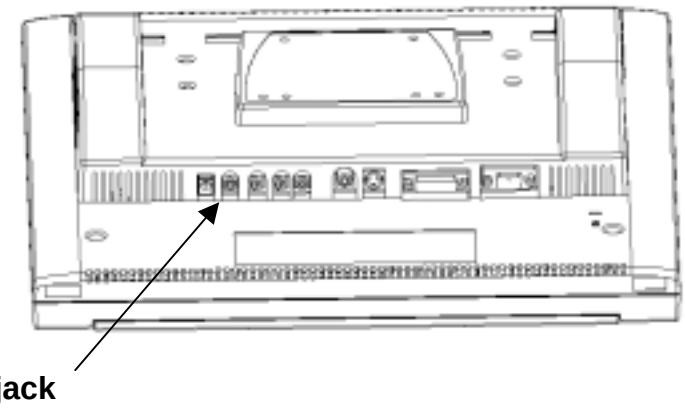


3) Plug the D-SUB 15-pin analog video signal cable (or 20-pin DFP cable) into the Analog (or Digital) Video Input port on the back of the display. Connect the other end of the video cable into your computer’s video port. The assignment of the pins of the connector is as follows:

Pin Assignment of 15-pin D-SUB connector			
1	Red Video	9	+5V for DDC circuit
2	Green Video	10	Logic Ground
3	Blue Video	11	Monitor Ground
4	Monitor Ground	12	DDC-Serial Data
5	DDC-Return	13	H-Sync.
6	Red Ground	14	V-Sync.
7	Green Ground	15	DDC-Serial Clock
8	Blue Ground		

Pin Assignment of 24-pin DVI-D connector			
1	T.M.D.S. Data2-	13	T.M.D.S. Data3+
2	T.M.D.S. Data2+	14	+5V Power
3	T.M.D.S. Data2/4 Shield	15	Ground (for +5V)
4	T.M.D.S. Data4-	16	Hot Plug Detect
5	T.M.D.S. Data4+	17	T.M.D.S. Data0-
6	DDC Clock	18	T.M.D.S. Data0+
7	DDC Data	19	T.M.D.S. Data0/5 Shield
8	No Connect	20	T.M.D.S. Data5-
9	T.M.D.S. Data1-	21	T.M.D.S. Data5+
10	T.M.D.S. Data1+	22	T.M.D.S. Clock Shield
11	T.M.D.S. Data1/3 Shield	23	T.M.D.S. Clock+
12	T.M.D.S. Data3-	24	T.M.D.S. Clock-

4) Connect the audio cable to the speaker input jack on the back of the display (the jack is colored green to match the cable plug and the writed audio 1):

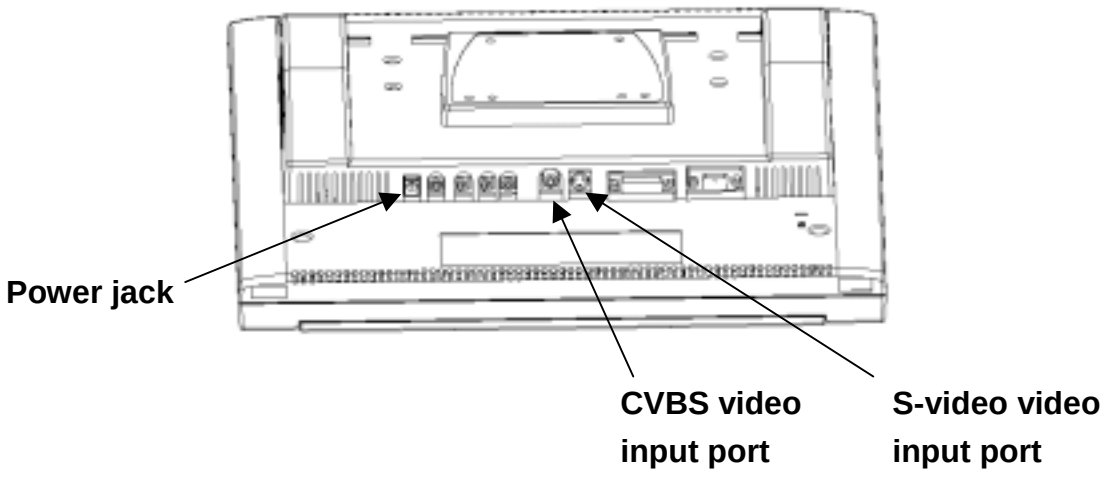


5) First turn the PC power switch ON. Then apply power to the display by pressing the power button to turn the monitor on. The power indicator LED will then illuminate.

Note: ***Do not force the cable into the connector; line it up carefully so that you don't bend the pins.***

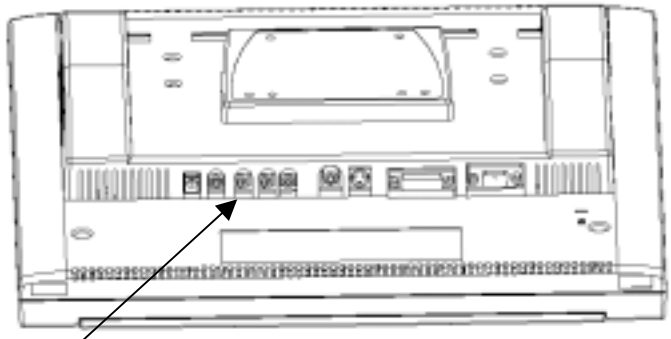
5.2 Connecting the monitor to an AV device

1) Plug the 4-pin s-video signal cable (or CVBS cable) into the S-video (or CVBS) Video Input port on the back of the display. Connect the other end of the video cable into your AV's video port. The assignment of the pins of the connector is as follows:



Pin Assignment of 4-pin mini-din connector			
1	GND	3	Y_in
2	GND	4	C_in

2) Connect the audio cable to the speaker input jack on the back of the display (labeled audio 2):



6. Electronic Circuit Description

The block diagram of CML155XW LCD monitor is shown in Appendix A.

6.1 Main Board Circuit

The circuit diagrams of main board are shown in Appendix B and the circuit diagrams of audio board, keyboard and inverter are shown in Appendix C, D and E, respectively.

(1) Analog Interface

Refer to circuit diagram titled 'Input Connector' in Appendix B.

I. The analog R, G, B video input signals are supplied through the cable which is terminated at P009 (i.e. CONNECTOR DB15). These input signals are approximately $0.7V_{PP}$ in amplitude.

   These and other signals which terminated at P009 are protected by D010~D015 (i.e. HSK120) from electrostatic discharge (ESD) damage.

   These R, G, B video signals are AC coupled via 0.01uF capacitors C244, C233 and C226 and buffered via 100 ohm resisters R076, R069 and R067, and then fed into I011:1 (i.e. GM5020) at pin E1, pin D2 and pin C1 respectively.
   These analog R, G and B video signals are converted to their digital forms in I011:1.

II. The HSYNC and VSYNC signals are of TTL level in amplitude and also protected by D016~D019 (i.e. HSK120). The protected version of these two signals are buffered via I021 (i.e. 74HCT14D) and then fed into I011:1 at pin L2 and pin K1.

III. The signals terminated at P009 pin 12 and pin 15 are protected by D006~D009 (i.e. HSK120) and then connected to I014 (i.e. 24WC02).
   I014 stores the EDID data that serves for the purpose of plug-and-play (P&P) functionality.

   The supply voltage of I014 (i.e., VCC at pin 8) is either from P009 pin 9 while CML155XW V is powered off (the power plug of AC adapter is completely disconnected from the power jack of CML155XW V) or from 5V source.

(2) Digital Interface

Refer to circuit diagram titled 'Input Connector' in Appendix B.

I. The TMDS LVDS (Low Voltage Differential Signal) input data pairs of digital R, G, and B signals are supplied through the cable which is terminated at P008 (i.e. 74320-4004) pin 18, 17, pin 10, 9 and pin 2, 1. and they are fed into I011:1 at pin C8, D8, pin C9, D9, and pin C10, D10 respectively.

II. Also there is a pair of LVDS clock signals from pin 23 and 24 at P008 and fed into I011:1 at pin C6 and D6.

III. The signals DDC/SCL and DDC/SDA terminated at P008 pin 6 and pin 7 are connected to I013 (i.e. 24WC02). I013 stores the EDID data that serves

for the purpose of plug-and-play (P&P) functionality. The power supply of I013 is from pin 14 (labeled DDC+5VDC) of P008.

(3) Memory Interface

Refer to circuit diagram titled ‘Frame Store’ in Appendix B.

There are three SDRAMs I015, I017, and I018 which provide the functionality of frame-rate conversion..

(4) Output Interface

Refer to circuit diagram titled ‘OUTPUT INTERFACE ’) in Appendix B

There are 8-bit even and 8-bit odd signals for each R, G, B channels from I011:2 (i.e. GM5020) that totally 48-bit data are fed into P010 and P011 via resistor buffers. Also there are another 4 control signals that are fed into P010: CLK, DE, VS and HS (at pin 44, 42, 40, and 38 of P010 respectively).

(5) Microcontroller

Refer to circuit diagram titled ‘Host’ in Appendix B.

I. The Microcontroller I006 (TS87C51RD2-MCB) is running with the clock based on 20MHz crystal X001. Pin 35 of I006 (/EA[1]) is pulled-up to +5 volt via resistor to force I006 read/write memory internally. It is important that pin 35 of I006 shall be so pulled up for its proper operation and I002 (i.e. HT7044A provide reset signal for I006 reset signal for I006.

   There is an interrupt signal comes from I011:5 pin R3 (IRQn) and is fed in to pin 14 of I006 (INT0).

   The signal designated VGA_CON (pin R4 of I011:5) is used for the determination of whether the analog signal video cable is connected to P009 or not. And the signal designated DVI_CON (pin L1 of I011:5) is used for the determination of whether the digital video signal cable is connected to P008 or not.

   The signals designated HDATA0~HDATA3, HCLK and HFSn (between pin 2 ~ 7 of I006 and pin R2, R1, P4, P3, P1 and P2 of I011:5) are used for the command and data transfer between these two ICs.

   The signal from pin 17 (P3.5) of I006 is the control signal for I003 (24LC16B). And the signal between pin 16 (P3.4) of I006 and pin 5 (SDA) of I003 is a bi-directional data channel.

   The signals designated KEY UP, KEY DOWN, KEY SEL, KEY ON/OFF between I006 and P006 serve as user key command scan and sense. P0.6 and P0.7 of I006 controls the conduction and cut-off of transistors Q003 and Q002 to light the LEDs.

   The signals designated VOLUME, AUDIO MUTE, and AUDIO SELECT between I006 and P004 are used for audio board control.

   The signal designated VOLUME_PWM is used for the volume of audio control. The

[1] “/EA” means EA signal is active “low”.

BKLT_PWM is used as backlight brightness control. BKLT_EN controls the backlight's on/off. And LCD_ON/OFF is used for turning on or off the LCD panel.

(6) Power

Refer to circuit diagram titled 'POWER' in Appendix B.

The DC +12V output of AC adapter is fed into the monitor through P002. This supply is regulated by I009 and I012 to provide +5V for the whole system. And the +5V supply is fed into I016, I005, I007, and I008 to provide multiple 3.3V and 2.5V supplies. The +12V also is fed into I001 to provide 5.0V independent for video decoder chip.

6.2 Audio Board Circuit

The circuit diagrams of audio board circuit is shown in Appendix C.

6.3 Keyboard Circuit

The circuit diagrams of keyboard circuit is shown in Appendix D.

6.4 Inverter Circuit

The circuit diagrams of inverter is shown in Appendix E. The inverter supplies power for backlight for the LCD panel.

7. Troubleshooting Flow Chart

For troubleshooting the monitor, please refer to “troubleshooting flow chart” in Appendix F.

8 Proposed Repair Parts List

For proposed repair parts list please refers to the Appendix G.

9. Mechanical Disassembly

For mechanical disassembly, please refer to Appendix H.

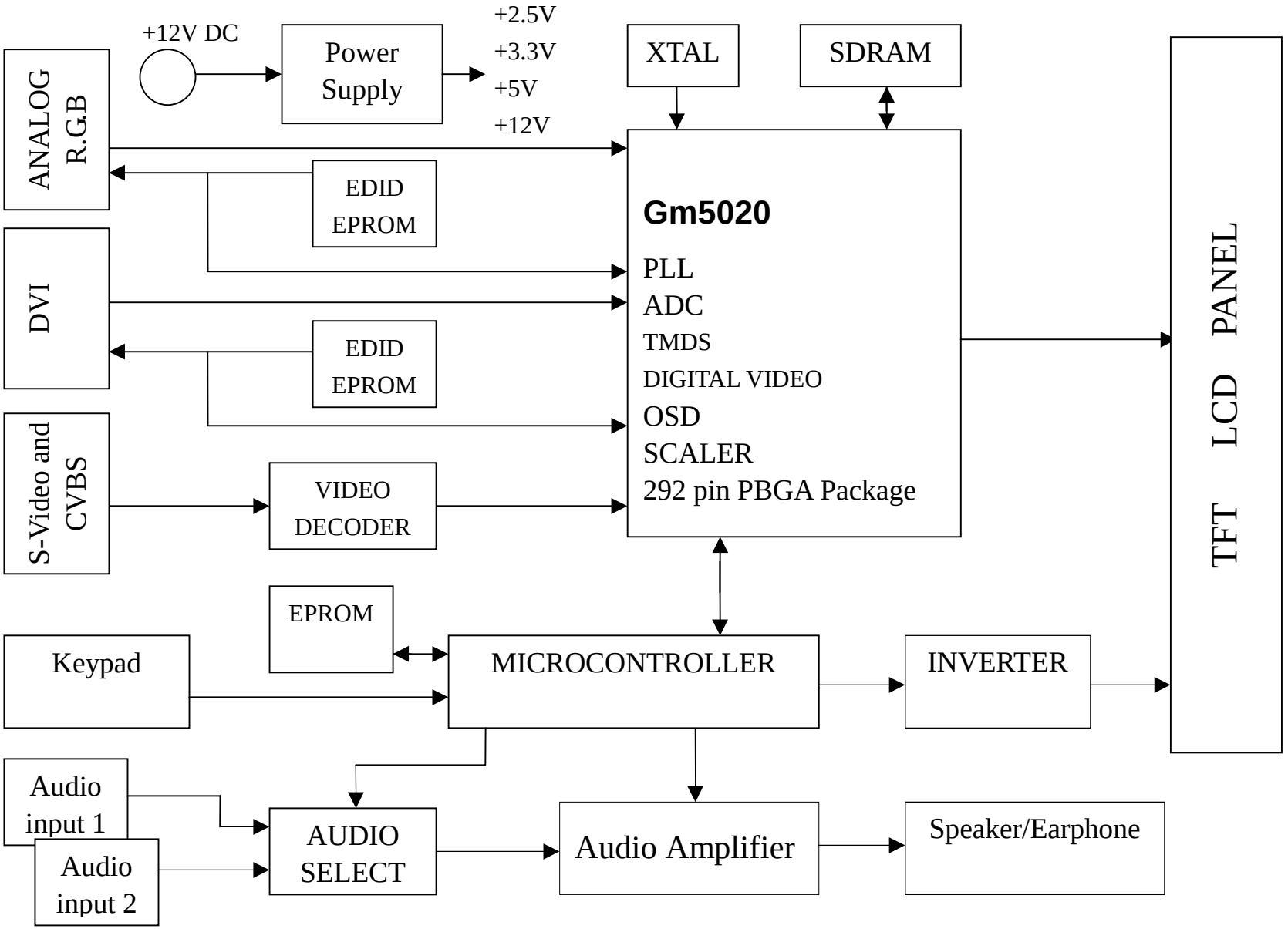
10. PCB Layout

For PCB layout diagrams, please refer to Appendix I.

Appendix A

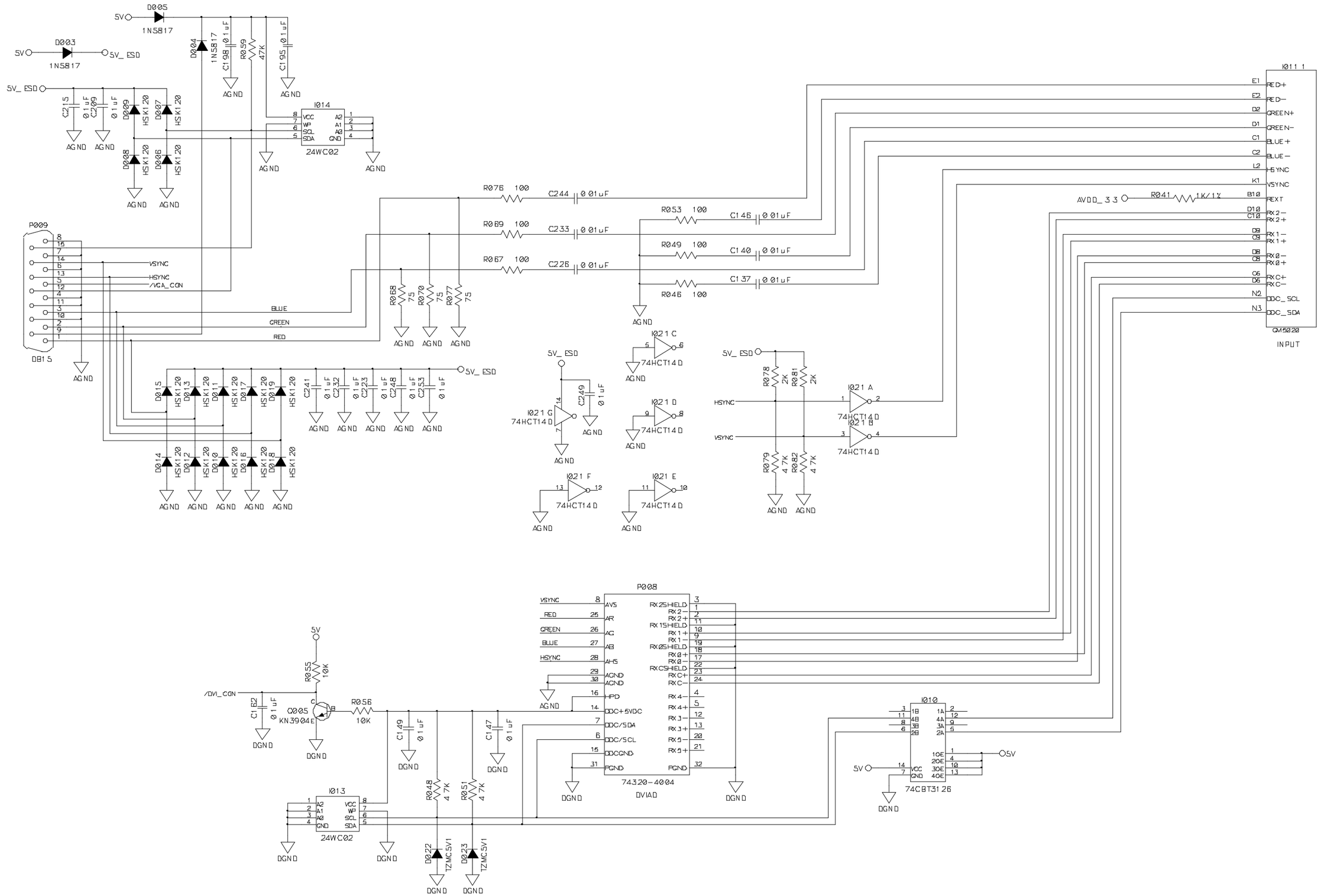
CML155XW
Main Board Block Diagram

CML155XW Main Board Block Diagram

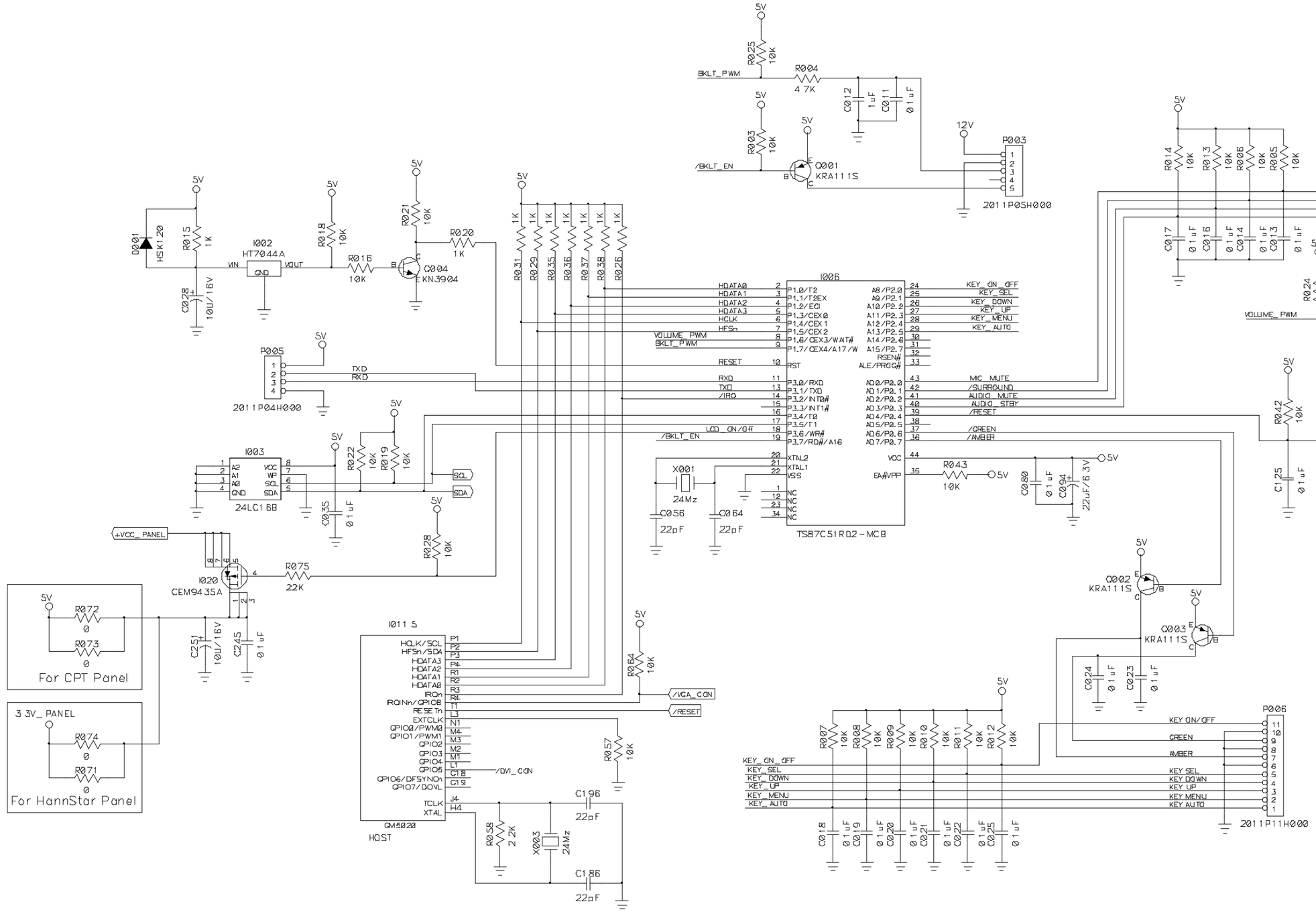


Appendix B

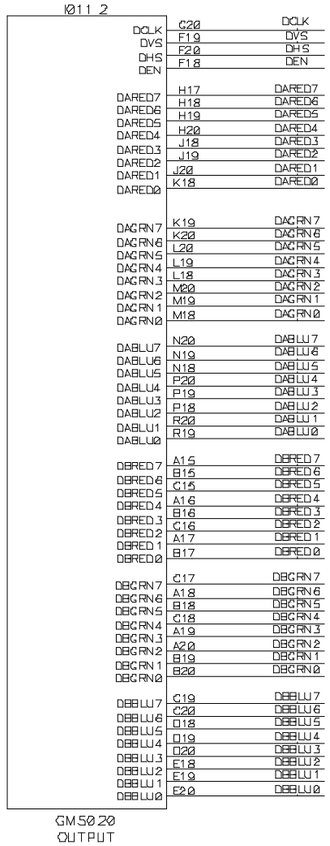
CML155XW
Main Board Circuits

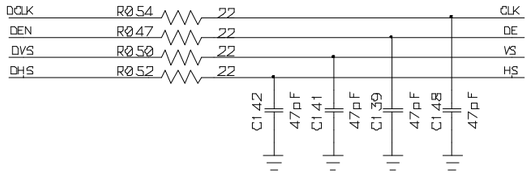


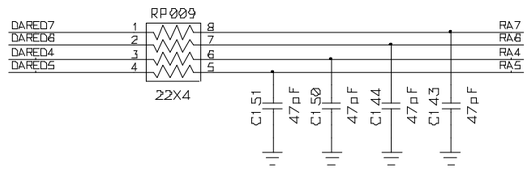
No. 0411	Input Connector	HITACHI

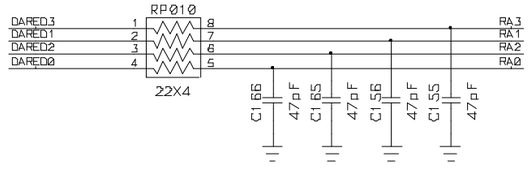


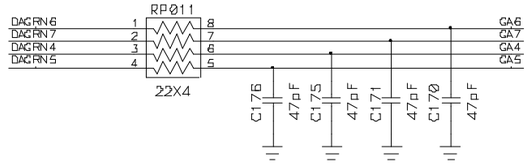
No. 0411	Host	HITACHI

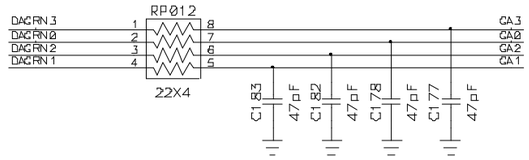

IØ11_2
DCLK C20 DCLK
DVS F19 DVS
DHS F20 DHS
DEN F18 DEN
DARED7 H17 DARED7
DARED6 H18 DARED6
DARED5 H19 DARED5
DARED4 H20 DARED4
DARED3 J18 DARED3
DARED2 J19 DARED2
DARED1 J20 DARED1
DARED0 K18 DARED0
DAGRN7 K19 DAGRN7
DAGRN6 K20 DAGRN6
DAGRN5 L20 DAGRN5
DAGRN4 L19 DAGRN4
DAGRN3 L18 DAGRN3
DAGRN2 M20 DAGRN2
DAGRN1 M19 DAGRN1
DAGRN0 M18 DAGRN0
DABLU7 N20 DABLU7
DABLU6 N19 DABLU6
DABLU5 N18 DABLU5
DABLU4 P20 DABLU4
DABLU3 P19 DABLU3
DABLU2 P18 DABLU2
DABLU1 R20 DABLU1
DABLU0 R19 DABLU0
DBRED7 A15 DBRED7
DBRED6 B15 DBRED6
DBRED5 C15 DBRED5
DBRED4 A16 DBRED4
DBRED3 B16 DBRED3
DBRED2 C16 DBRED2
DBRED1 A17 DBRED1
DBRED0 B17 DBRED0
DBGRN7 C17 DBGRN7
DBGRN6 A18 DBGRN6
DBGRN5 B18 DBGRN5
DBGRN4 C18 DBGRN4
DBGRN3 A19 DBGRN3
DBGRN2 A20 DBGRN2
DBGRN1 B19 DBGRN1
DBGRN0 B20 DBGRN0
DBBLU7 C19 DBBLU7
DBBLU6 C20 DBBLU6
DBBLU5 D18 DBBLU5
DBBLU4 D19 DBBLU4
DBBLU3 D20 DBBLU3
DBBLU2 E18 DBBLU2
DBBLU1 E19 DBBLU1
DBBLU0 E20 DBBLU0
GM5020
OUTPUT

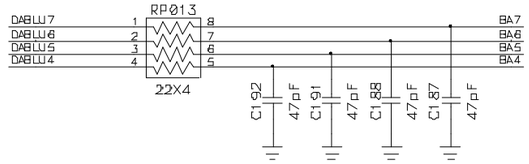

DCLK R054 22 CLK
DEN R047 22 DE
DVS R050 22 VS
DHS R052 22 HS
C142 47pF
C141 47pF
C139 47pF
C148 47pF

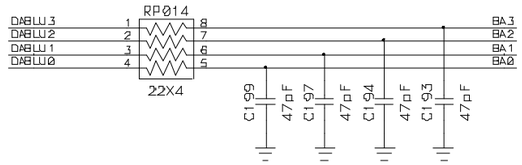

RP009
DARED7 RA7
DARED6 RA6
DARED4 RA4
DARED5 RA5
22X4
C151 47pF
C150 47pF
C144 47pF
C143 47pF

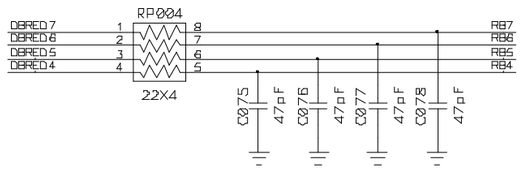

RP010
DARED3 RA3
DARED1 RA1
DARED2 RA2
DARED0 RA0
22X4
C166 47pF
C165 47pF
C156 47pF
C155 47pF

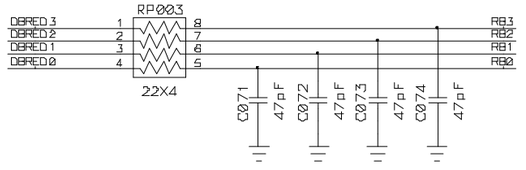

RP011
DAGRN6 GA6
DAGRN7 GA7
DAGRN4 GA4
DAGRN5 GA5
22X4
C176 47pF
C175 47pF
C171 47pF
C170 47pF

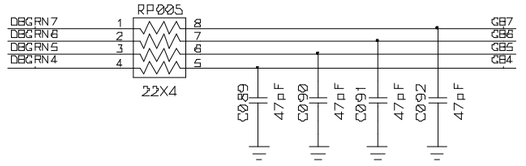

RP012
DAGRN3 GA3
DAGRN0 GA0
DAGRN2 GA2
DAGRN1 GA1
22X4
C183 47pF
C182 47pF
C178 47pF
C177 47pF

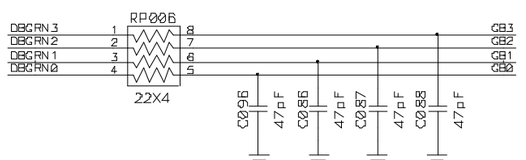

RP013
DABLU7 BA7
DABLU6 BA6
DABLU5 BA5
DABLU4 BA4
22X4
C192 47pF
C191 47pF
C188 47pF
C187 47pF

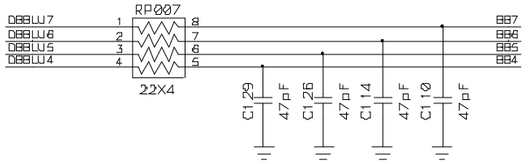

RP014
DABLU3 BA3
DABLU2 BA2
DABLU1 BA1
DABLU0 BA0
22X4
C199 47pF
C197 47pF
C194 47pF
C193 47pF

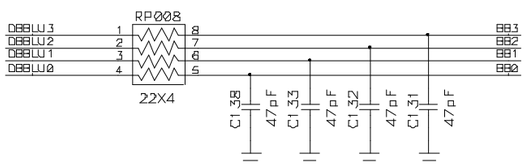

RP004
DBRED7 RB7
DBRED6 RB6
DBRED5 RB5
DBRED4 RB4
22X4
C075 47pF
C076 47pF
C077 47pF
C078 47pF

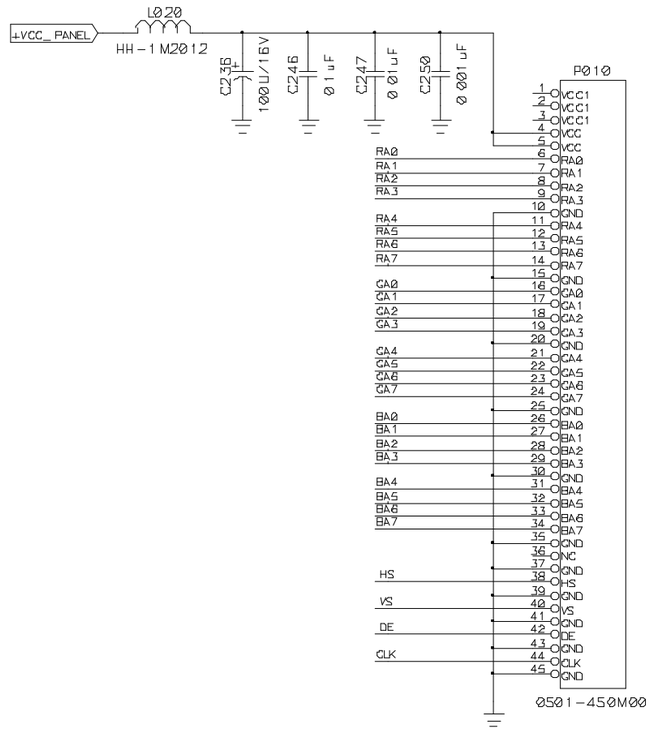

RP003
DBRED3 RB3
DBRED2 RB2
DBRED1 RB1
DBRED0 RB0
22X4
C071 47pF
C072 47pF
C073 47pF
C074 47pF

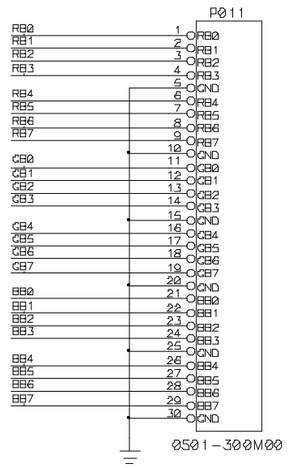

RP005
DBGRN7 GB7
DBGRN6 GB6
DBGRN5 GB5
DBGRN4 GB4
22X4
C089 47pF
C090 47pF
C091 47pF
C092 47pF

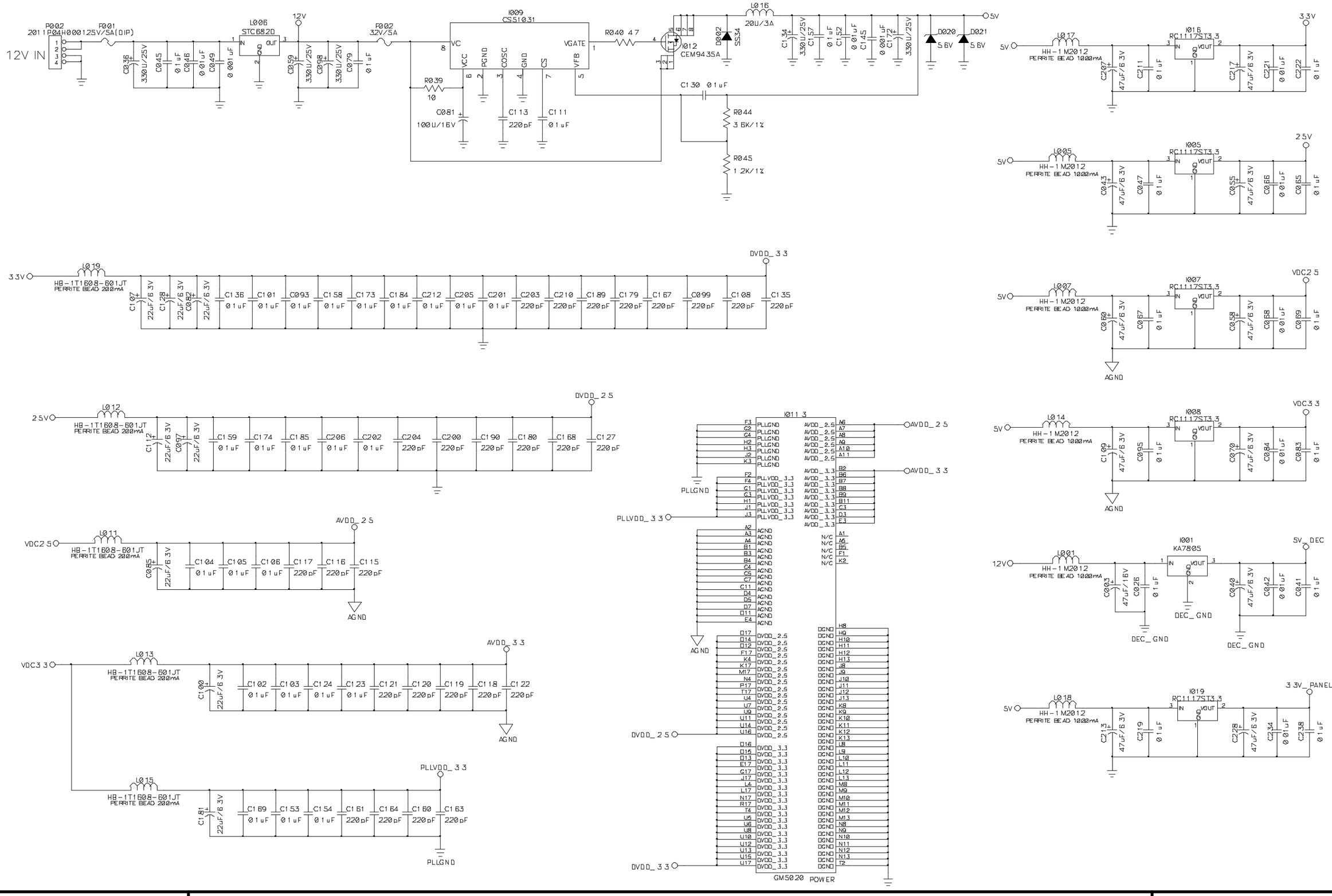

RP006
DBGRN3 GB3
DBGRN2 GB2
DBGRN1 GB1
DBGRN0 GB0
22X4
C096 47pF
C086 47pF
C087 47pF
C088 47pF

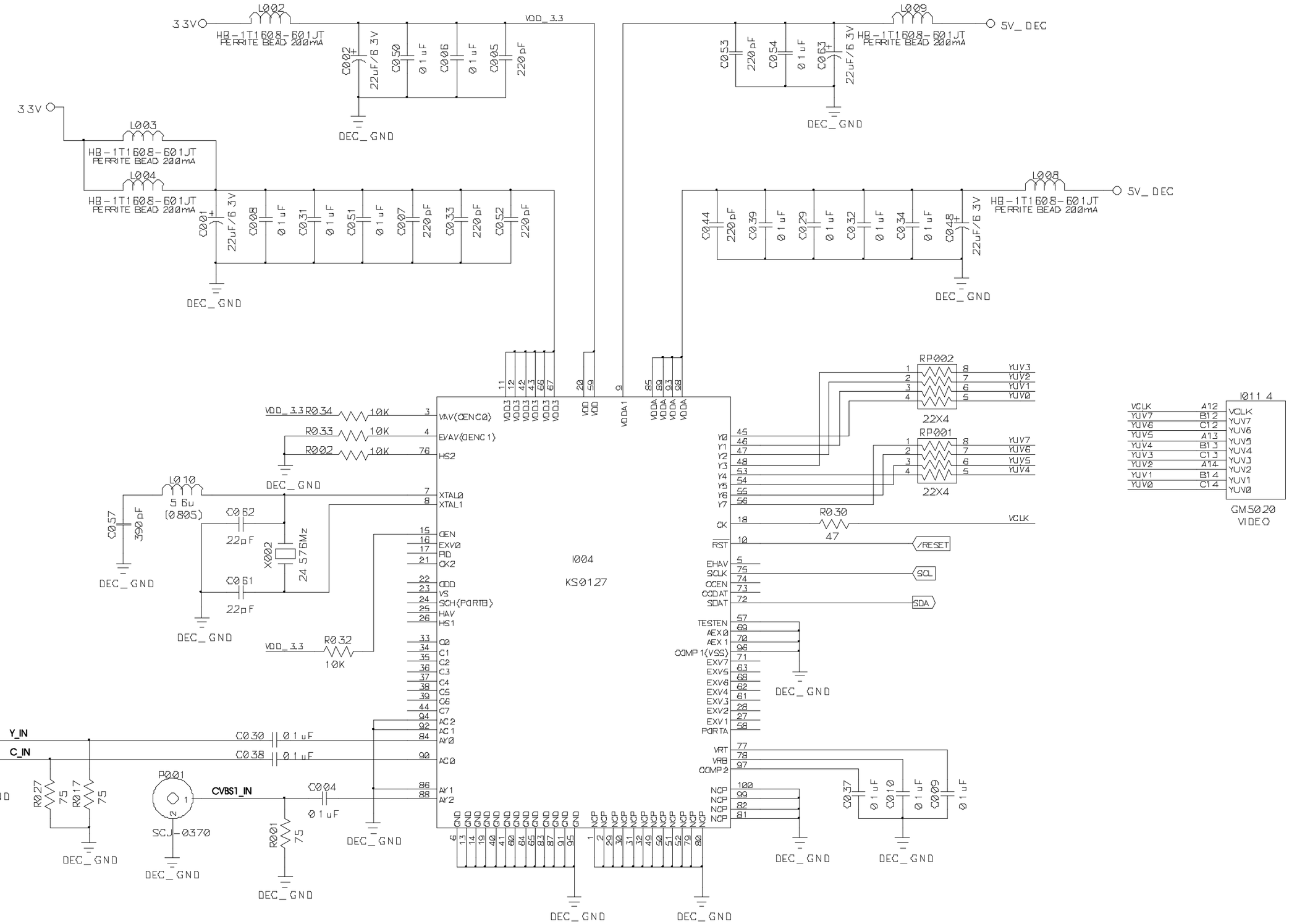

RP007
DBBLU7 BB7
DBBLU6 BB6
DBBLU5 BB5
DBBLU4 BB4
22X4
C129 47pF
C126 47pF
C114 47pF
C110 47pF


RP008
DBBLU3 BB3
DBBLU2 BB2
DBBLU1 BB1
DBBLU0 BB0
22X4
C138 47pF
C133 47pF
C132 47pF
C131 47pF

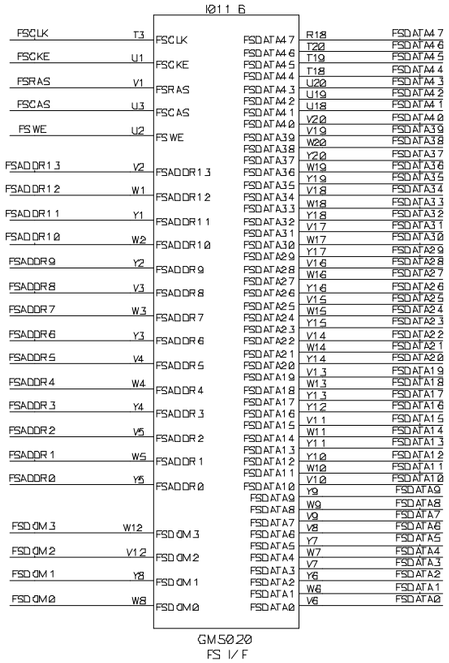

L020
+VCC_PANEL
HH-1M2012
C236 100U/16V
C246 0.1uF
C247 0.01uF
C250 0.001uF
P010
VCC1
VCC1
VCC1
VCC
VCC
RA0
RA1
RA2
RA3
GND
RA4
RA5
RA6
RA7
GND
GA0
GA1
GA2
GA3
GND
GA4
GA5
GA6
GA7
GND
BA0
BA1
BA2
BA3
GND
BA4
BA5
BA6
BA7
GND
NC
GND
HS
GND
VS
GND
DE
GND
CLK
GND
0501-450M00

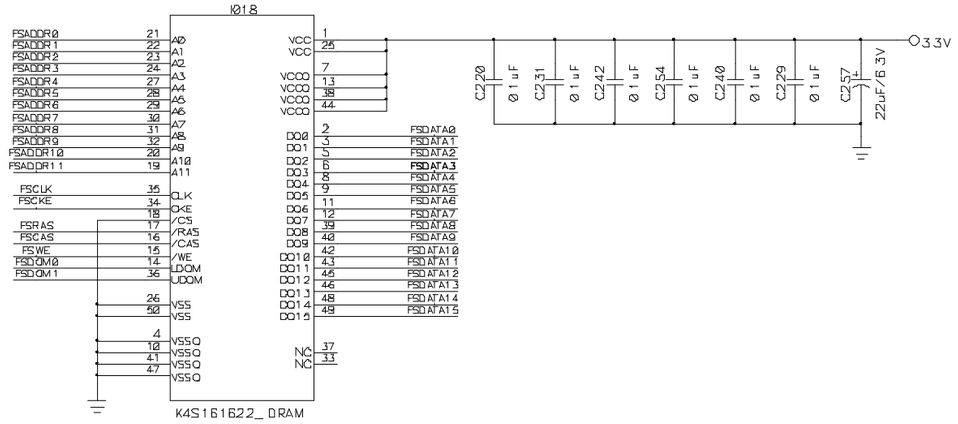

P011
RB0
RB1
RB2
RB3
GND
RB4
RB5
RB6
RB7
GND
GB0
GB1
GB2
GB3
GND
GB4
GB5
GB6
GB7
GND
BB0
BB1
BB2
BB3
GND
BB4
BB5
BB6
BB7
GND
0501-300M00

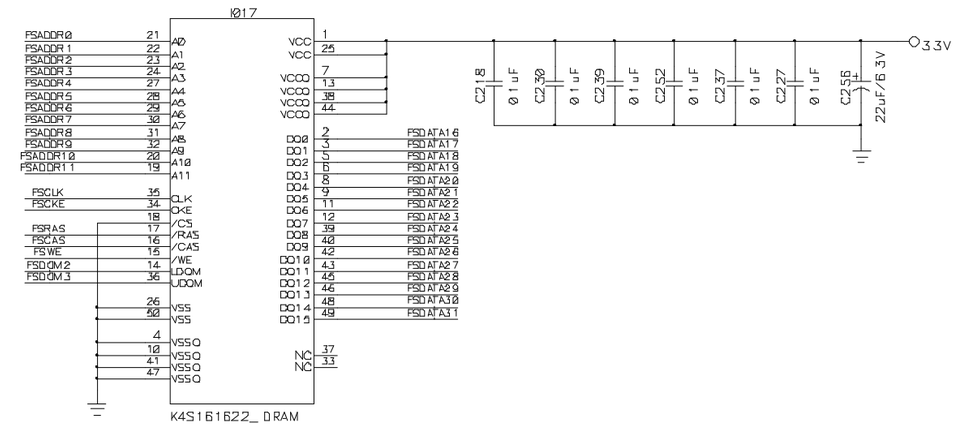

12V IN
P002
2011P04H000125V/5A(DIP)
F001
L006
STC6820
12V
F002
3.2V/5A
I009
CS51031
VC
VCC
PGND
COSC
GND
CS
VFB
VGATE
R040 47
I012
CEM9435A
L016
20U/3A
D002
SS34
D020
5.6V
D021
5.6V
5V
R039
10
C081
100U/16V
C113
220pF
C111
0.1uF
C130 0.1uF
R044
3.6K/1%
R045
1.2K/1%
3.3V
L017
HH-1M2012
PERRITE BEAD 1000mA
I016
RC1117ST3.3
2.5V
L005
I005
L019
HB-1T1608-601JT
PERRITE BEAD 200mA
DVDD_3.3
L007
I007
VDC2.5
AGND
L012
DVDD_2.5
L014
I008
VDC3.3
L011
AVDD_2.5
L013
AVDD_3.3
L015
PLLVDD_3.3
PLLGND
I011.3
GM5020 POWER
AGND
DVDD_2.5
DVDD_3.3
I001
KA7805
5V_DEC
DEC_GND
L018
I019
3.3V_PANEL

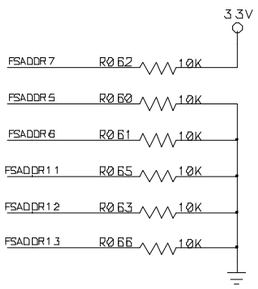


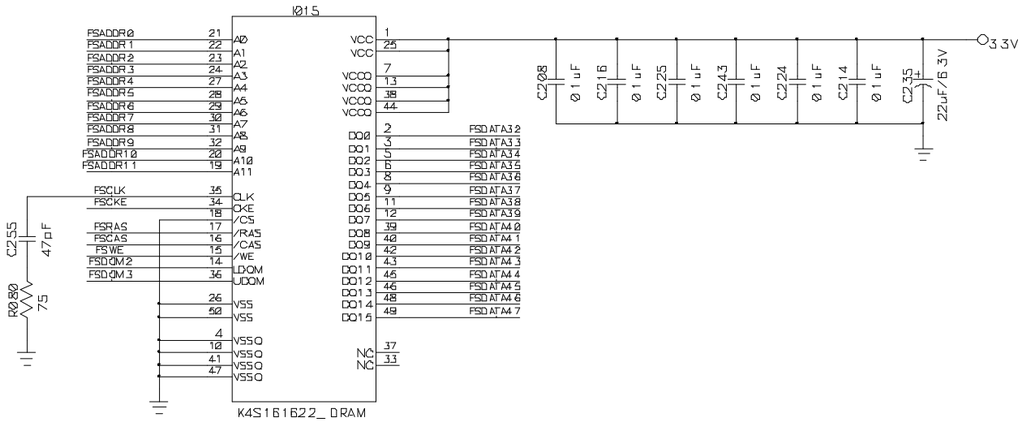
No. 0411	Video Decoder	HITACHI


U116
FSCLK T3
FSCKE U1
FSRAS Y1
FSCAS U3
FSWE U2
FSADDR13 V2
FSADDR12 W1
FSADDR11 Y1
FSADDR10 W2
FSADDR9 Y2
FSADDR8 V3
FSADDR7 W3
FSADDR6 Y3
FSADDR5 V4
FSADDR4 W4
FSADDR3 Y4
FSADDR2 V5
FSADDR1 W5
FSADDR0 Y5
FSDQM3 W12
FSDQM2 V12
FSDQM1 Y8
FSDQM0 W8
FSCLK
FSCKE
FSRAS
FSCAS
FSWE
FSADDR13
FSADDR12
FSADDR11
FSADDR10
FSADDR9
FSADDR8
FSADDR7
FSADDR6
FSADDR5
FSADDR4
FSADDR3
FSADDR2
FSADDR1
FSADDR0
FSDQM3
FSDQM2
FSDQM1
FSDQM0
R18 FSDATA47
T20 FSDATA46
T19 FSDATA45
T18 FSDATA44
U20 FSDATA43
U19 FSDATA42
U18 FSDATA41
V20 FSDATA40
V19 FSDATA39
W20 FSDATA38
Y20 FSDATA37
W19 FSDATA36
Y19 FSDATA35
V18 FSDATA34
W18 FSDATA33
Y18 FSDATA32
V17 FSDATA31
W17 FSDATA30
Y17 FSDATA29
V16 FSDATA28
W16 FSDATA27
Y16 FSDATA26
V15 FSDATA25
W15 FSDATA24
Y15 FSDATA23
V14 FSDATA22
W14 FSDATA21
Y14 FSDATA20
V13 FSDATA19
W13 FSDATA18
Y13 FSDATA17
Y12 FSDATA16
V11 FSDATA15
W11 FSDATA14
Y11 FSDATA13
Y10 FSDATA12
W10 FSDATA11
V10 FSDATA10
Y9 FSDATA9
W9 FSDATA8
V9 FSDATA7
V8 FSDATA6
Y7 FSDATA5
W7 FSDATA4
V7 FSDATA3
Y6 FSDATA2
W6 FSDATA1
V6 FSDATA0
GM5020
FS I/F


U118
FSADDR0 21
FSADDR1 22
FSADDR2 23
FSADDR3 24
FSADDR4 27
FSADDR5 28
FSADDR6 29
FSADDR7 30
FSADDR8 31
FSADDR9 32
FSADDR10 20
FSADDR11 19
FSCLK 35
FSCKE 34
18
FSRAS 17
FSCAS 16
FSWE 15
FSDQM0 14
FSDQM1 36
26
50
4
10
41
47
1
25
7
13
38
44
2
3
5
6
8
9
11
12
39
40
42
43
46
48
49
37
33
C220 0.1uF
C231 0.1uF
C242 0.1uF
C254 0.1uF
C240 0.1uF
C229 0.1uF
C257 22uF/6.3V
3.3V
K4S161622_DRAM

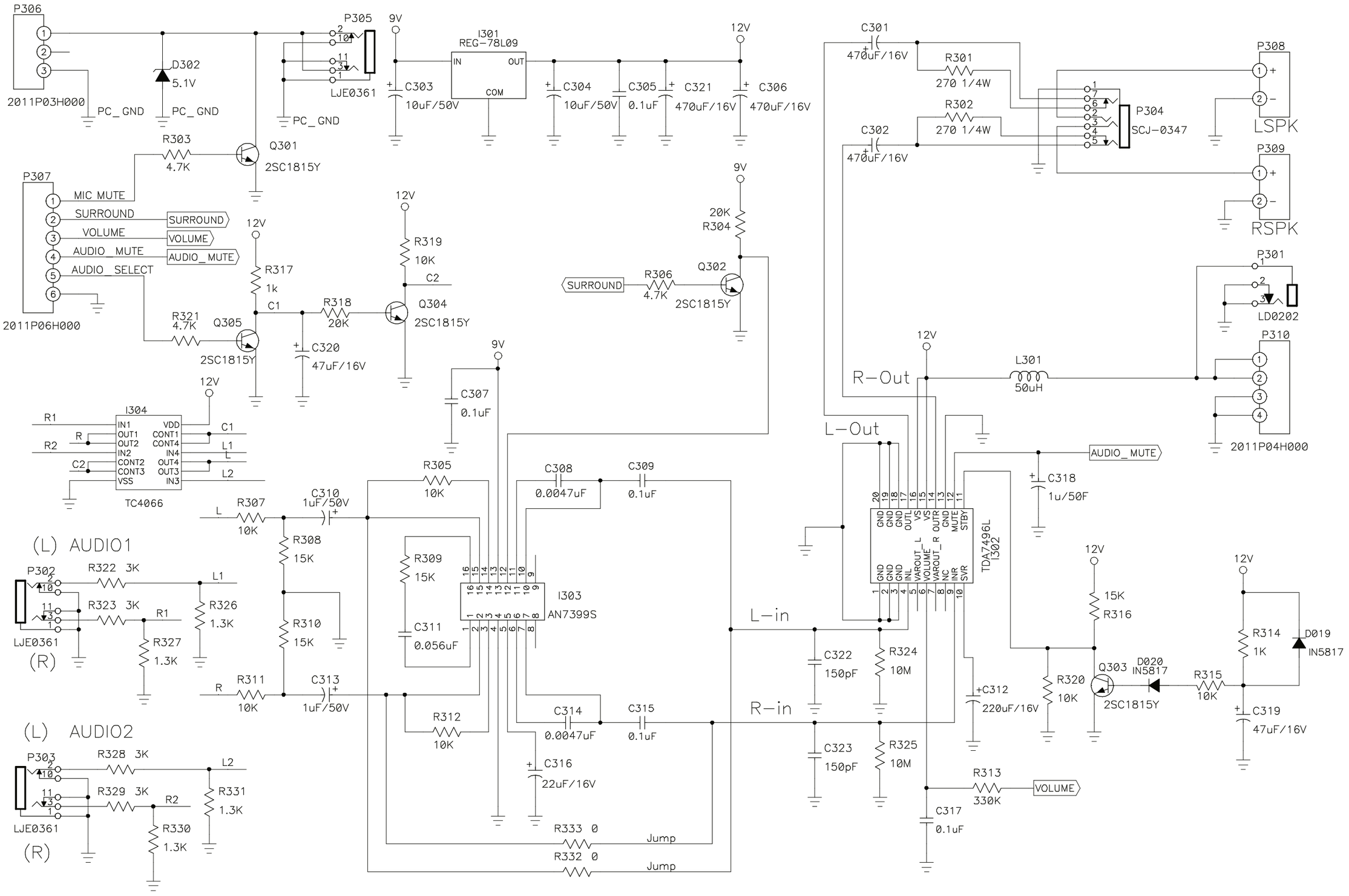

U117
FSADDR0 21
FSADDR1 22
FSADDR2 23
FSADDR3 24
FSADDR4 27
FSADDR5 28
FSADDR6 29
FSADDR7 30
FSADDR8 31
FSADDR9 32
FSADDR10 20
FSADDR11 19
FSCLK 35
FSCKE 34
18
FSRAS 17
FSCAS 16
FSWE 15
FSDQM2 14
FSDQM3 36
26
50
4
10
41
47
1
25
7
13
38
44
2
3
5
6
8
9
11
12
39
40
42
43
46
48
49
37
33
C218 0.1uF
C230 0.1uF
C239 0.1uF
C252 0.1uF
C237 0.1uF
C227 0.1uF
C256 22uF/6.3V
3.3V
K4S161622_DRAM


3.3V
FSADDR7 R062 10K
FSADDR5 R060 10K
FSADDR6 R061 10K
FSADDR11 R065 10K
FSADDR12 R063 10K
FSADDR13 R066 10K


U115
FSADDR0 21
FSADDR1 22
FSADDR2 23
FSADDR3 24
FSADDR4 27
FSADDR5 28
FSADDR6 29
FSADDR7 30
FSADDR8 31
FSADDR9 32
FSADDR10 20
FSADDR11 19
FSCLK 35
FSCKE 34
18
FSRAS 17
FSCAS 16
FSWE 15
FSDQM2 14
FSDQM3 36
26
50
4
10
41
47
1
25
7
13
38
44
2
3
5
6
8
9
11
12
39
40
42
43
46
48
49
37
33
C255 47pF
R080 75
C208 0.1uF
C216 0.1uF
C225 0.1uF
C243 0.1uF
C224 0.1uF
C214 0.1uF
C235 22uF/6.3V
3.3V
K4S161622_DRAM

Appendix C

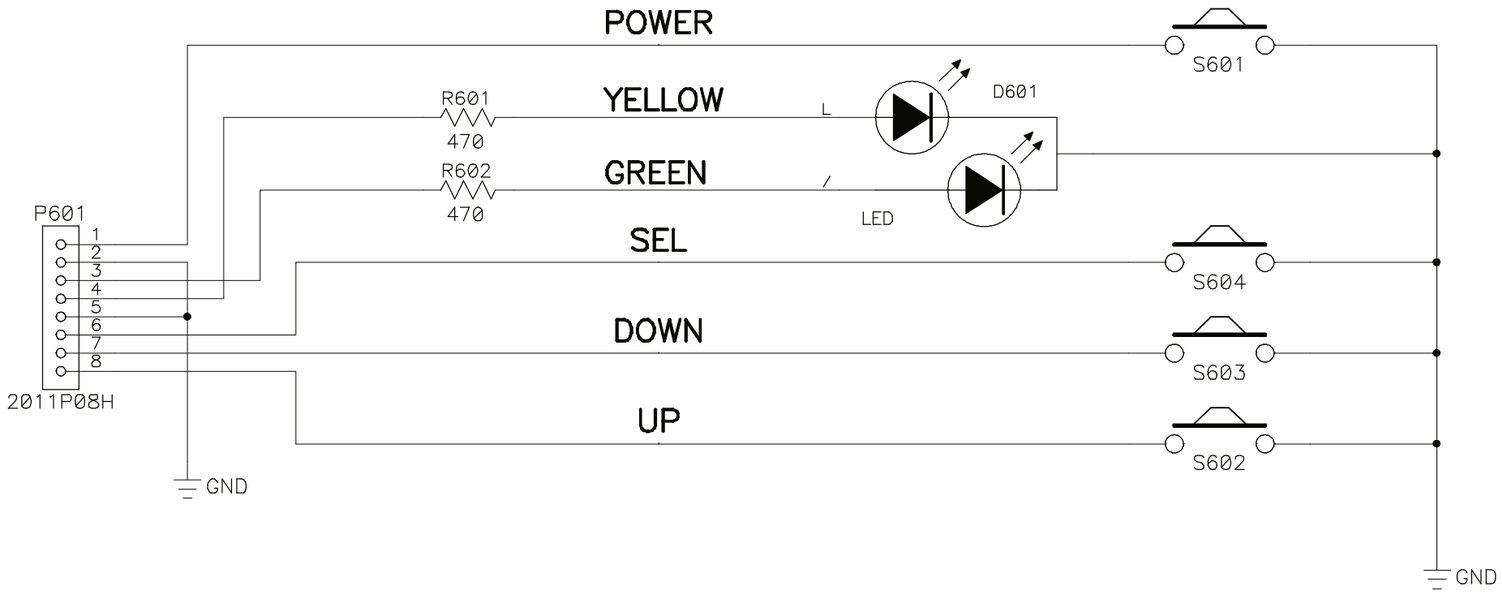
CML155XW
Audio Board Circuit



No. 0411	Audio Board	HITACHI

Appendix D

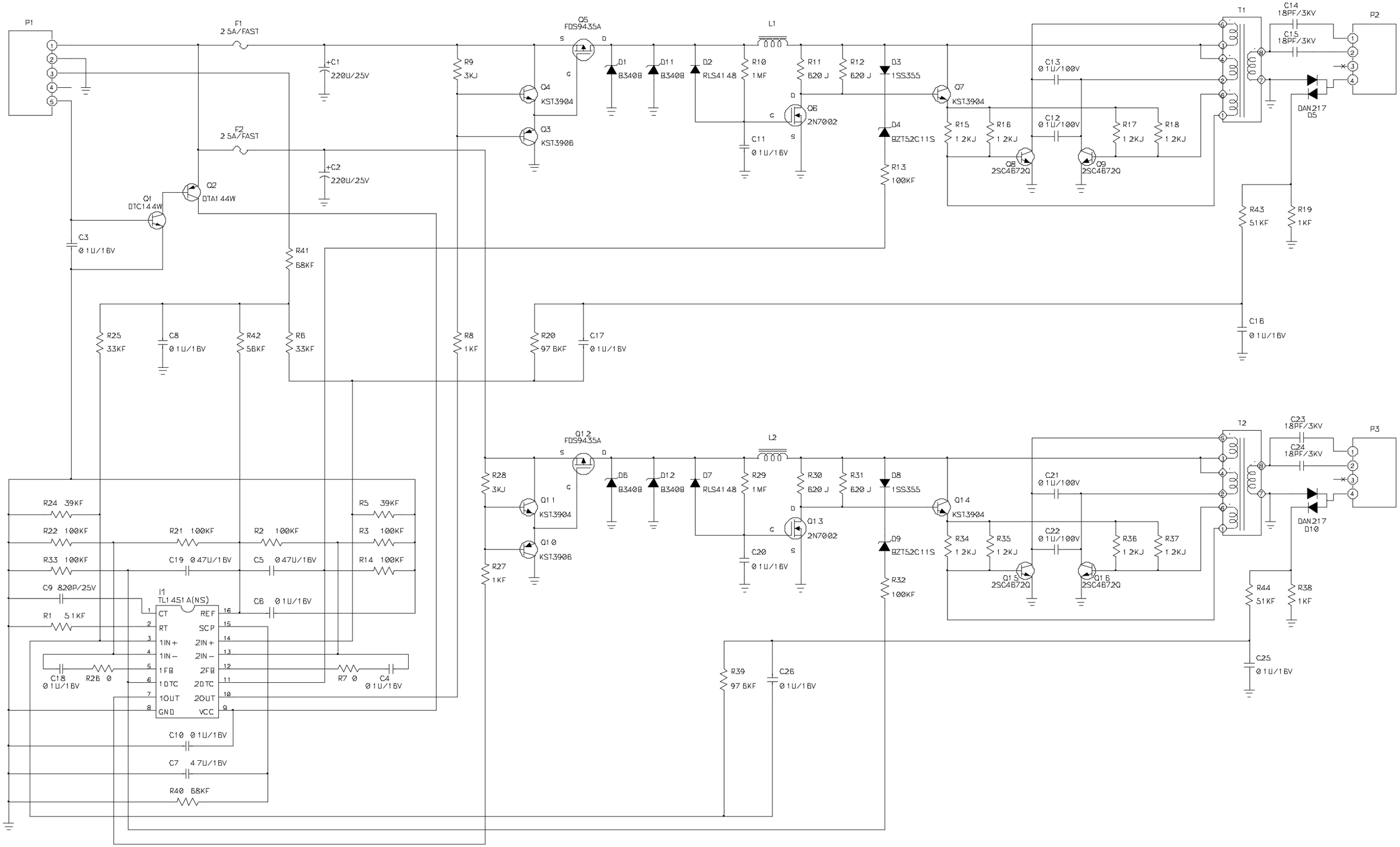
CML155XW
Key Board Circuit



No. 0411	Key Board	HITACHI

Appendix E

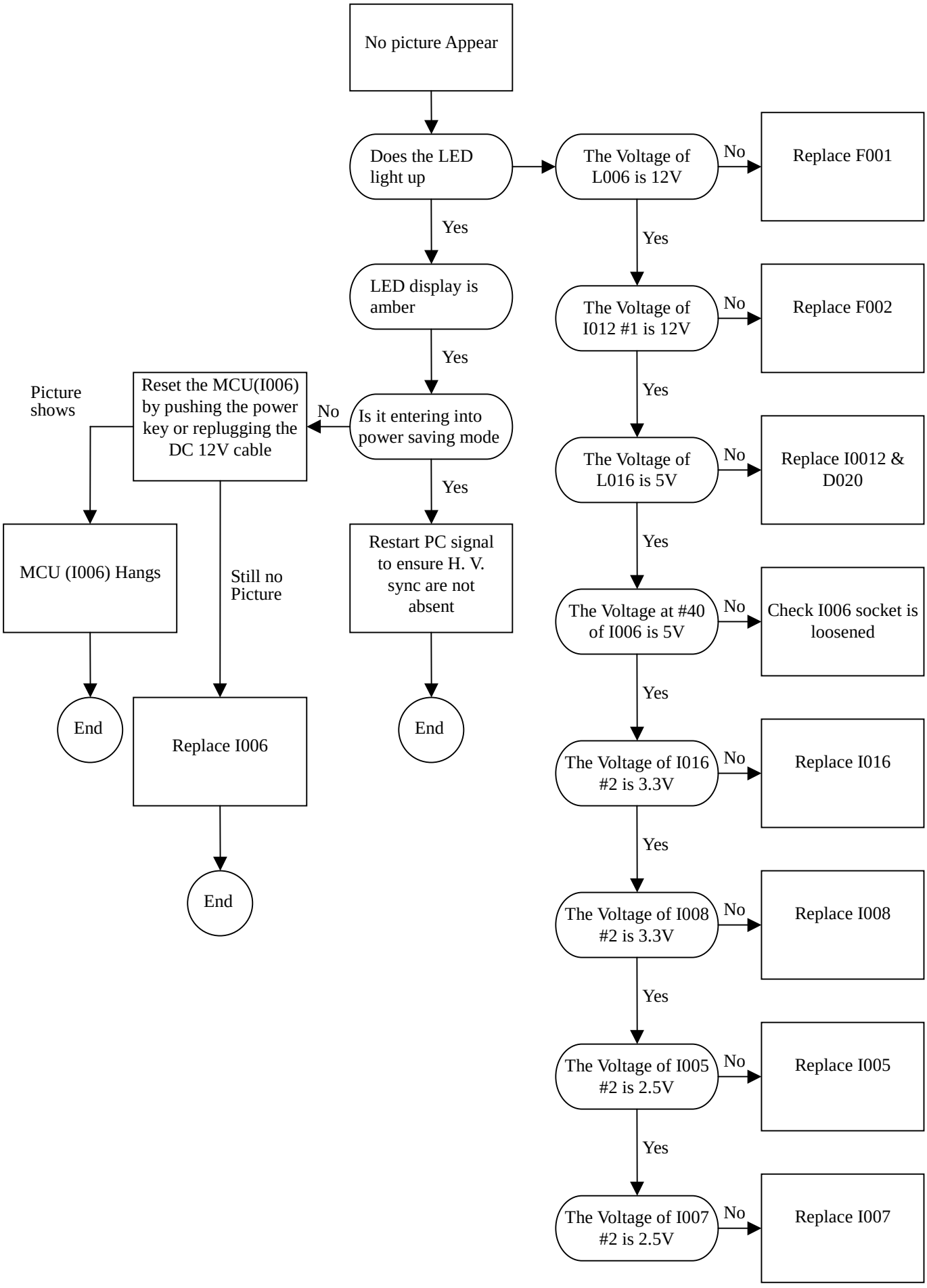
CML155XW
Inverter Board Circuit

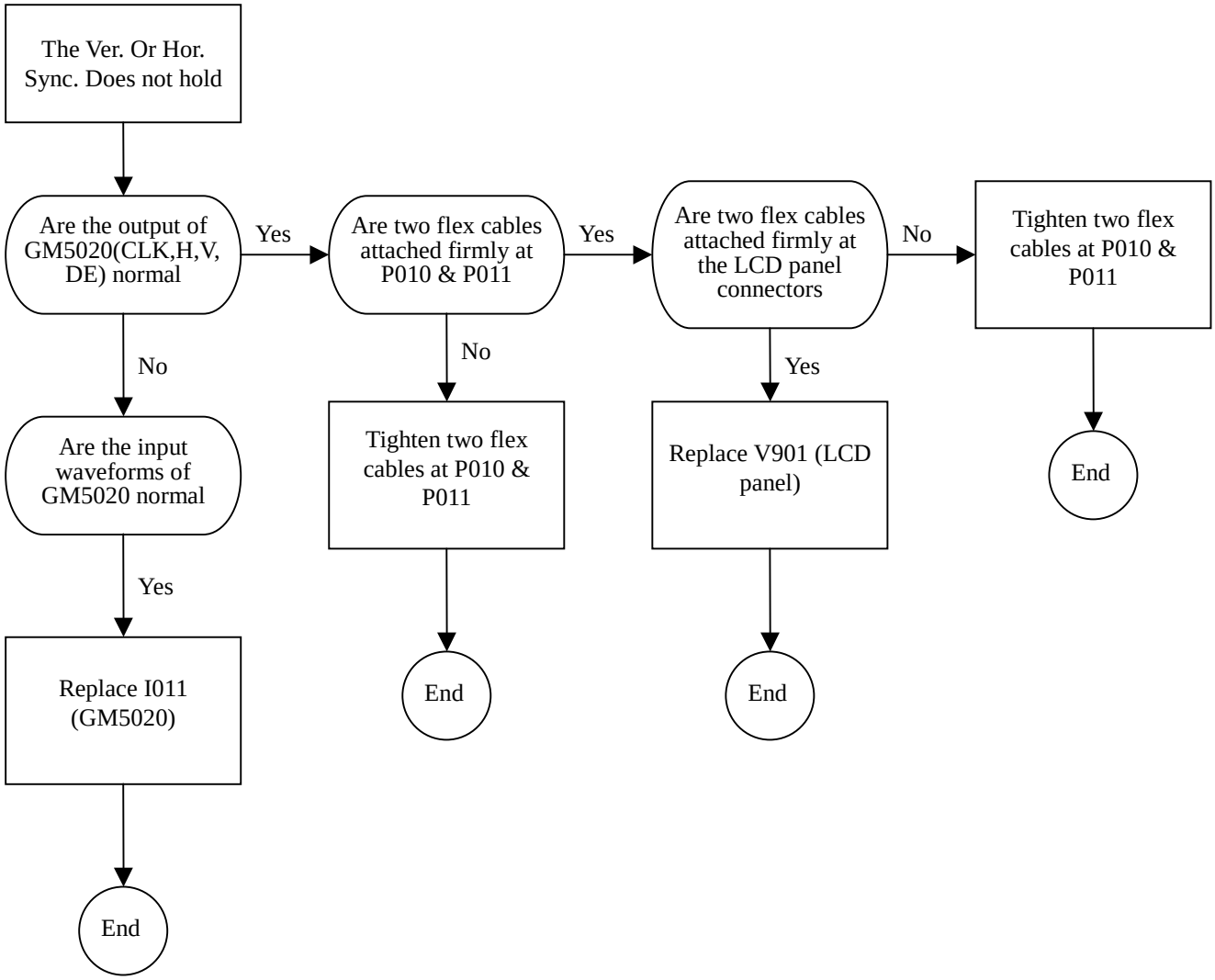


No. 0411	Inverter Board	HITACHI

Appendix F

CML155XW
Troubleshooting Flow
Charts


No picture Appear
Does the LED light up
No
The Voltage of L006 is 12V
No
Replace F001
Yes
Yes
LED display is amber
The Voltage of I012 #1 is 12V
No
Replace F002
Yes
Yes
Is it entering into power saving mode
No
Reset the MCU(I006) by pushing the power key or replugging the DC 12V cable
Picture shows
The Voltage of L016 is 5V
No
Replace I0012 & D020
Yes
Yes
Restart PC signal to ensure H. V. sync are not absent
MCU (I006) Hangs
Still no Picture
The Voltage at #40 of I006 is 5V
No
Check I006 socket is loosened
Yes
Yes
End
Replace I006
End
The Voltage of I016 #2 is 3.3V
No
Replace I016
Yes
End
The Voltage of I008 #2 is 3.3V
No
Replace I008
Yes
The Voltage of I005 #2 is 2.5V
No
Replace I005
Yes
The Voltage of I007 #2 is 2.5V
No
Replace I007


The Ver. Or Hor. Sync. Does not hold
Are the output of GM5020(CLK,H,V, DE) normal
Yes
Are two flex cables attached firmly at P010 & P011
Yes
Are two flex cables attached firmly at the LCD panel connectors
No
Tighten two flex cables at P010 & P011
No
Are the input waveforms of GM5020 normal
No
Tighten two flex cables at P010 & P011
Yes
Replace V901 (LCD panel)
End
Yes
Replace I011 (GM5020)
End
End
End

Appendix G

CML155XW
Repair Parts List

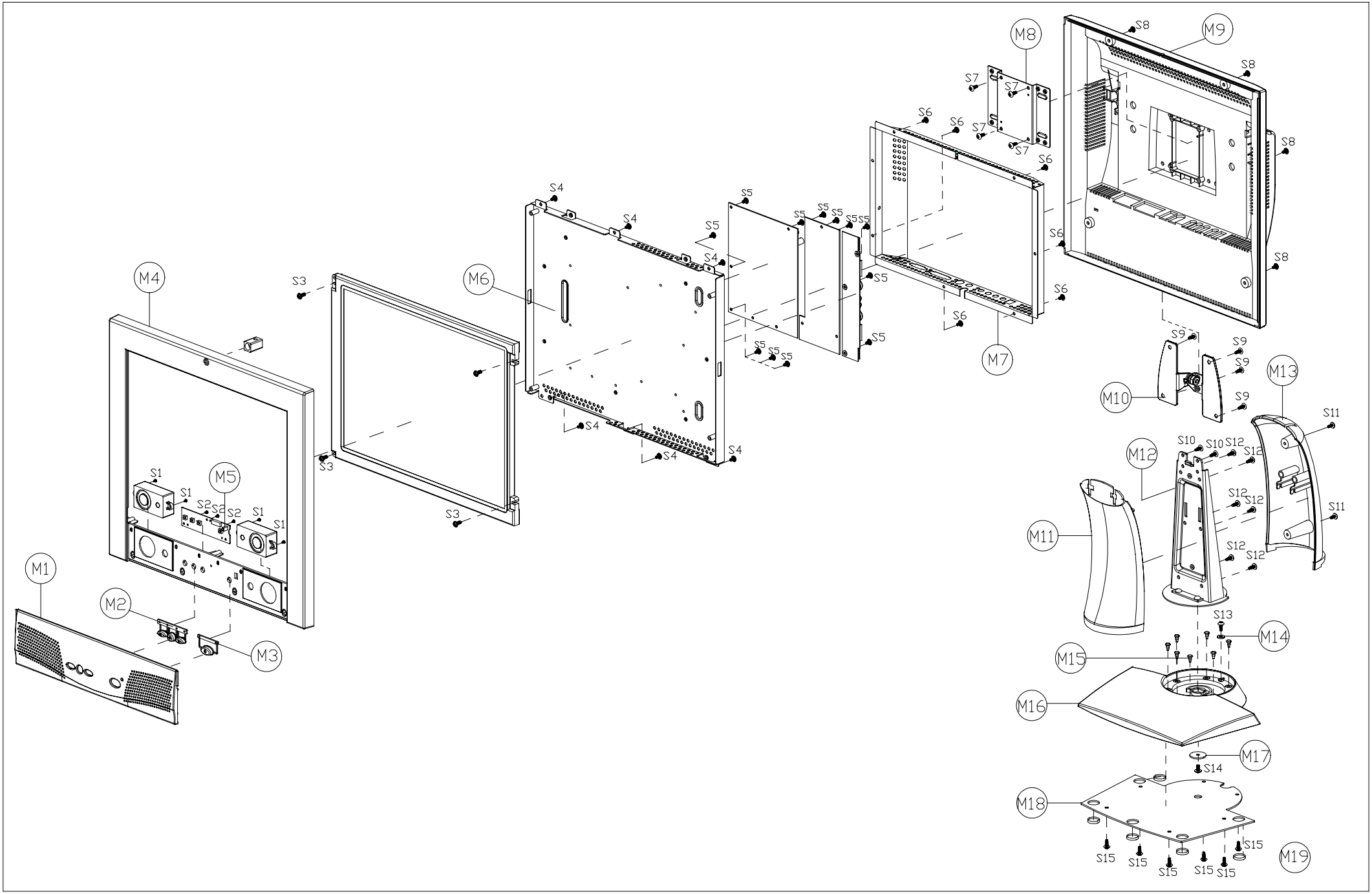
THE UPDATED PARTS LIST

FOR THIS MODEL IS

AVAILABLE ON ESTA

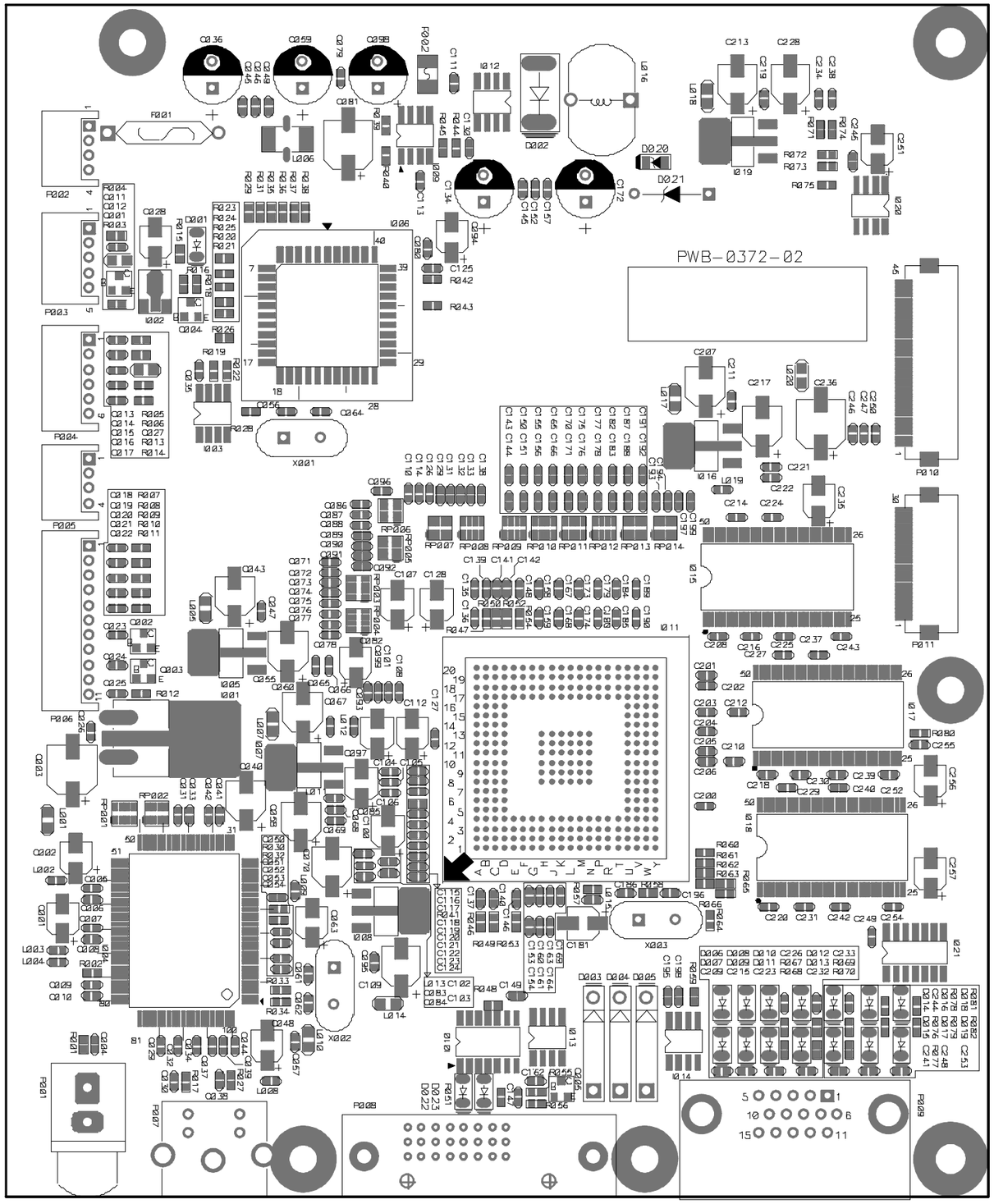
Appendix H

CML155XW
Mechanical Disassembly

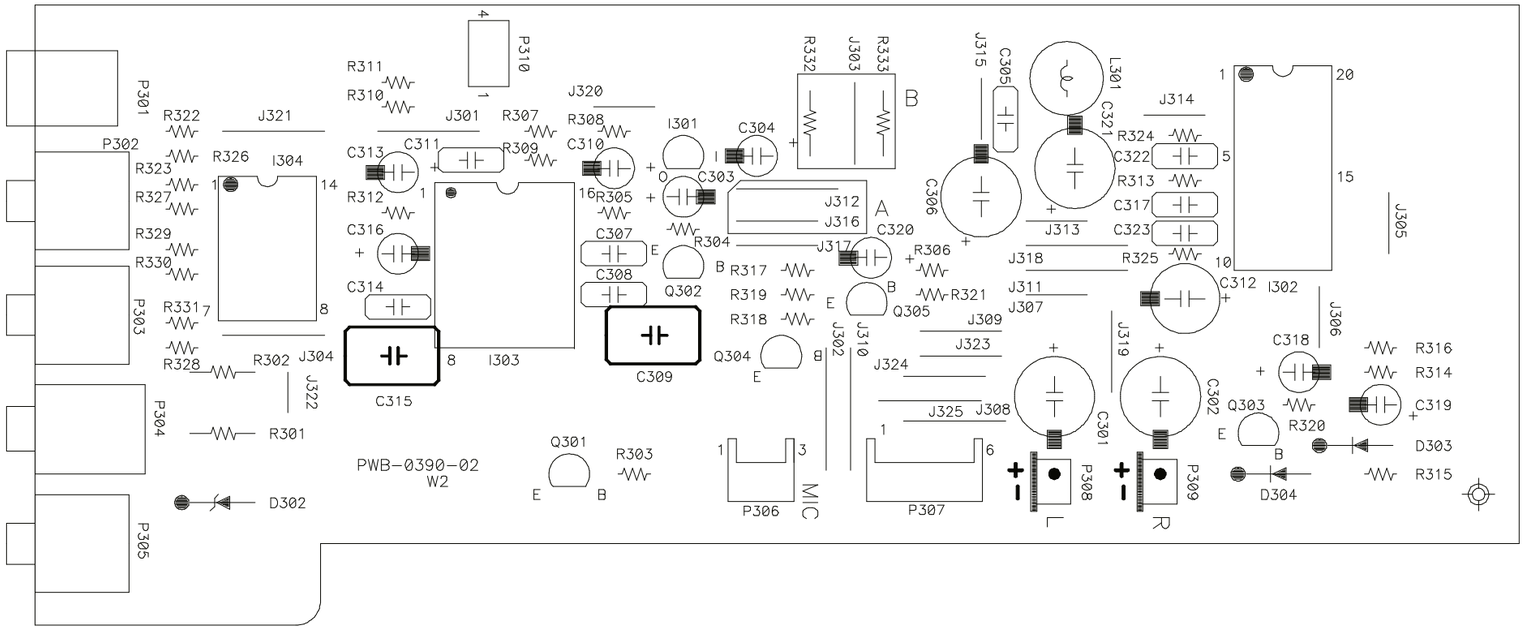

M1
M2
M3
M4
M5
M6
M7
M8
M9
M10
M11
M12
M13
M14
M15
M16
M17
M18
M19
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15

Appendix I

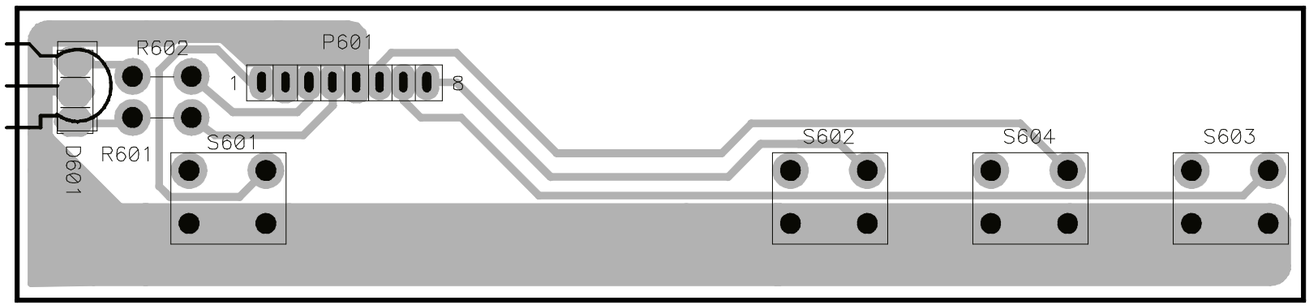
CML155XW
Printed Circuit Boards



No. 0411	Main Board	HITACHI

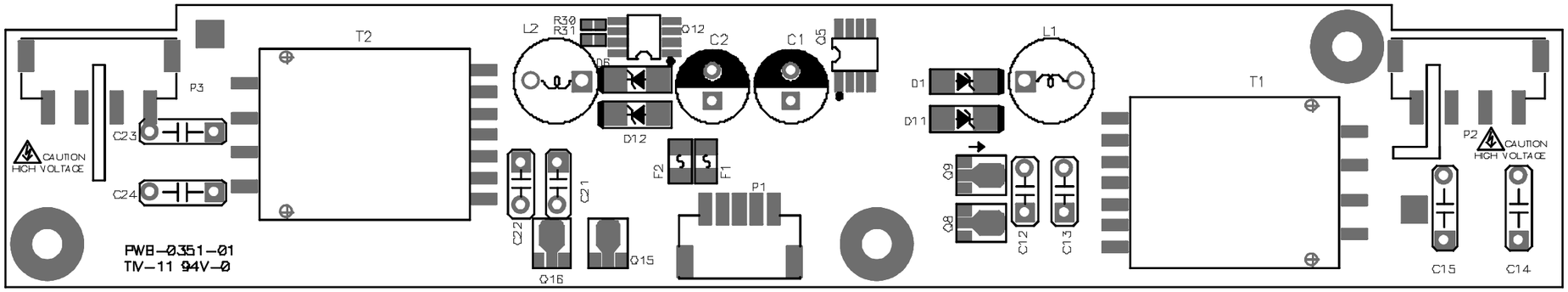


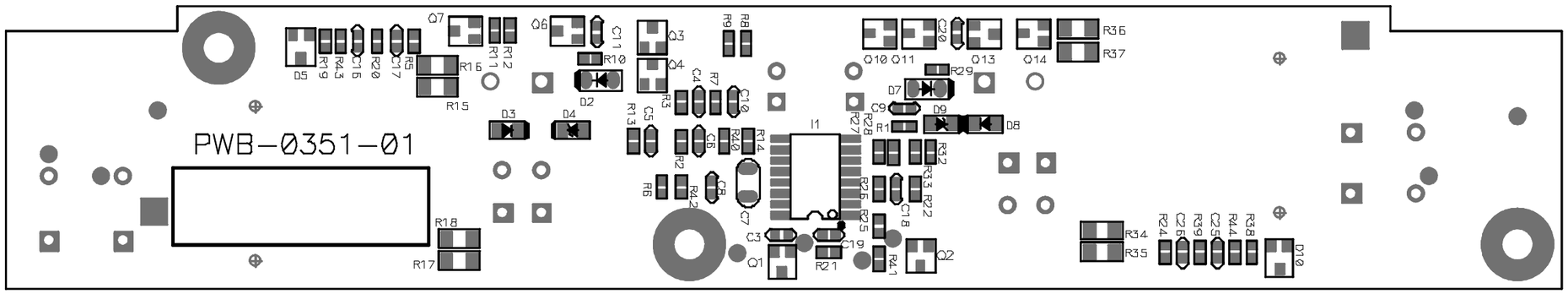
No. 0411	Audio Board PCB	HITACHI



No. 0411	Key Board PCB	HITACHI

Component Side





Solder Side

No. 0411	Inverter Board	HITACHI

HITACHI

Hitachi, Ltd. Tokyo, Japan
International Sales Division
THE HITACHI ATAGO BUILDING,
No. 15 –12 Nishi Shinbashi, 2 – Chome,
Minato – Ku, Tokyo 105-8430, Japan.
Tel: 03 35022111

HITACHI EUROPE LTD,
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire
SL6 8YA
UNITED KINGDOM
Tel: 01628 643000
Fax: 01628 643400
Email: **consumer-service@hitachi-eu.com**

HITACHI EUROPE S.A.
364 Kifissias Ave. & 1, Delfon Str.
152 33 Chalandri
Athens
GREECE
Tel: 1-6837200
Fax: 1-6835964
Email: **service.hellas@hitachi-eu.com**

HITACHI EUROPE GmbH
Munich Office
Dornacher Strasse 3
D-85622 Feldkirchen bei München
GERMANY
Tel: +49-89-991 80-0
Fax: +49-89-991 80-224
Hotline: +49-180-551 25 51 (12ct/min)
Email: **HSE-DUS.service@hitachi-eu.com**

HITACHI EUROPE S.A.
Gran Via Carlos III, 101-1
08028 Barcelona
SPAIN
Tel: 93 409 2550
Fax: 93 491 3513
Email: **atencion.cliente@hitachi-eu.com**

HITACHI EUROPE srl
Via Tommaso Gulli N.39, 20147
Milano, Italia
ITALY
Tel: +39 02 487861
Tel: +39 02 38073415 Servizio Clienti
Fax: +39 02 48786381/2
Email: customerservice.italy@hitachi-eu.com

HITACHI Europe AB
Box 77 S-164 94 Kista
SWEDEN
Tel: +46 (0) 8 562 711 00
Fax: +46 (0) 8 562 711 13
Email: **csgswe@hitachi-eu.com**

HITACHI EUROPE S.A.S
Lyon Office
B.P. 45, 69671 BRON CEDEX
FRANCE
Tel: 04 72 14 29 70
Fax: 04 72 14 29 99
Email: **france.consommateur@hitachi-eu.com**

HITACHI EUROPE LTD (Norway) AB
STRANDVEIEN 18
1366 Lysaker
NORWAY
Tel: 67 5190 30
Fax: 67 5190 32
Email: **csgnor@hitachi-eu.com**

HITACH EUROPE AB
Egebækgård
Egebækvej 98
DK-2850 Nærum
DENMARK
Tel: +45 43 43 6050
Fax: +45 43 60 51
Email: **csgnor@hitachi-eu.com**

HITACHI EUROPE AB
Neopoli / Niemenkatu 73
FIN-15140 Lahti
FINLAND
Tel : +358 3 8858 271
Fax: +358 3 8858 272
Email: **csgnor@hitachi-eu.com**

Hitachi Europe Ltd
Bergensesteenweg 421
1600 Sint-Pieters-Leeuw
BELGIUM
Tel: +32 2 363 99 01
Fax: +32 2 363 99 00
Email: **sofie.van.bom@hitachi-eu.com**

HITACHI EUROPE LTD
Na Sychrove 975/8
101 27 Praha 10 – Bohdalec
CZECH REPUBLIC
Tel: +420 267 212 383
Fax: +420 267 212 385
Email: **csgnor@hitachi-eu.com**

www.hitachidigitalmedia.com